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Is famous the wide world over, and it is from this racial trait our national drinking customs have arisen. To heartily welcome a visitor or to entertain a friend has always been regarded as a sacred duty. And how can anyone be welcomed better than with hearty invitation to join with you in a glass or two of

# Budweiser

## The King of All Bottled Beers

This famous brew is "a friend" of every man who uses it. Not only is it a delightful drink in itself but, because of its tonic qualities, it is highly healthful. Good barley and hop beer has always been used by the strongest and most civilized nations of the earth.

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**Anheuser-Busch Brewery**
St. Louis, U. S. A.
CORKED OR WITH CROWN CAPS

**Budweiser**
is served at all first-class Hotels, Clubs and Cafes throughout the world.

## You Never Can Tell.

"You think you do—but you don't."
—*Bernard Shaw.*

IN the touch-and-go of the daily show
Where the virtues are highly prized,
We've a conscience sweet with the mild conceit
That we're terribly civilized;
And we're looking down with a Jove-like frown
On the Turk or the Hottentot,
While we spread our wings like the perfect things
Which we *think* we are—but we're not.

This nation of ours, as it tells the Powers,
Is the land of the free and the brave;
In God we trust, and we're awfully just,
And we haven't the sign of a slave.
No peasants toil on our chainless soil,
As labor the sons of the Czar;
For we're not in the books of the fierce Grand Dukes—
We *think* we're not—but we are.

There's no great span 'twixt the Congressman
And the humblest Mick in the ditch;
We see no charms in a coat of arms,
And we don't bow down to the rich.
We never graze with a thankful gaze
In the fields of the parvenu;
We never stare at a millionaire—
We *think* we don't—but we do.

*Wallace Irwin.*

## Chicago.

"WHERE do you pass your honeymoons?"

STRONGER THAN ATLAS.

MAY FIRST.

*Mrs. Oldt* (to JOHN, THEY'RE PERFECTLY LOVELY—ALL THE MODERN IMPROVEMENTS, TWO FLIGHTS UP, NINE ROOMS, AND ALL DARK.

# CIVILIZATION

### Powders.

IT is not easy to conceive of civilization prior to the year 1453. For the great powders, viz., gun, complexion and sleeping, have all come into use since that date.

Time was when gunpowder had necessarily to be smelled by such as contemplated becoming heroes in any large sense, but at present this is only measurably so. The peace sentiment has gotten itself greatly intensified, in late years, and, besides, the sense of smell is by no means what it was. In these days, the greatest heroes are those who can pick a President in advance, and get solid.

Complexion powders have wrought great social upheavals. If it were not for complexion powders, many a woman would hardly have the face to come out in the open and demand her just rights, choosing rather to remain in thralldom than appear publicly in her natural colors.

Sleeping powders come very handy. Nothing else seems to be able to relax the eternal vigilance which is the price of prosperity.

YOU see the sort of style we offer you; the clothes themselves are as good as they look; all-wool fabrics, always.

Look for our mark in them, as your guide and security; a small thing to look for, a big thing to find. Spring Style Book for six cents.

Hart Schaffner & Marx

Good Clothes Makers

Chicago Boston New York

# Here and There in the Realm of Sport

IN CINCINNATI the fans are singing the praises of Clarke Griffith, the new manager of the Reds, and many verbal bouquets are likewise being handed to Roger Bresnahan in St. Louis since the mighty former catcher of the Giants signed to manage the Cardinals. But if the two new managers fail to "deliver home the goods" they may hear some different words. It is to be sincerely hoped that the world does not have to wait long for chances for, while both have unquestioned ability, they cannot take a few good players and a lot that are not nearly so good and make pennant winners of them in a couple of weeks.

It is understood that "Dan" Kelly, holder of the accepted world's amateur sprinting record of nine and three-fifths seconds for the 100-yard dash, has retired permanently from the cinder path to go into business.

The Cleveland club has sold Steve Adams to the Chicago American League club.

It is reported that Jim Casey, the manager of the Anaheim club of the outlaw California League, has signed Tommy Downey, of the Brooklyn club, and Ivan Howard, formerly of the New York and the Pittsburgh National League clubs.

"Jim Mac" Jim McGinley will sub for Mills the Queen next season. Watson on his services have been almost for, and it looks as if the ever mighty backer was now headed for some other league berth.

All old athletes recently connected by the registration committee of the Metropolitan Association of the American Athletic Union were reinstated after a hearing before the committee on Saturday in New York, just as the meeting was dissolved. The men to avail were Martin Sheridan, Charles Dacey, Harry Porter, and George Bishop, of the Irish-American A. C., Fred Schaer, of the New York A. C., and James Lee, of the Mercury A. C. The official charge against the men, with the exception of Lee, was their failure to send in an immediate response last year when sent to Buffalo to take part in the games of the Seventy-fourth Regiment. Lee came under the committee's unfavorable eye because he persisted in keeping in a suspended position. That he always signed the entries for the meetings against him would, no doubt, never have been brought to the attention of the committee had not Secretary Dean called the matter to the attention of the committee. Lee's suspension was lifted by the committee, it seemed unfortunately from partial motive, but may be expected to come to the front again at any time with some more scandal to absorb space. As the rules of the sporting division of the Metropolitan Association of the A. A. U. is making a decided hit.

The recent appointment of Harry Lumley to lead the Brooklyn team completes the list of managers of the two major leagues for the season of 1909, with one exception. At this writing Fielder Jones, of the White Sox, is the only leader who is still in doubt. Four new managers will be seen in the National League. Jennings succeeds Dooin in Major Bresnahan, formerly the star catcher of the Giants, who was traded to the St. Louis Cardinals, of which he was appointed manager. Lumley, who takes on the task of managing the Superbas, has a fine lot of ball players, and may make a first division team of them. He will be back at his old position in right field, and, with Dahlen and Dunkard with him in the outer garden, this trio should be unsurpassed by any. Two new faces will be seen in the field of American League teams, namely, Frank Stallings, the new leader of the Yankees, who was formerly with the Newark Eastern League team, and Fred Lake, of the Boston. The list of managers in the two big leagues for next season and the positions they will occupy follow: National League—New York, J. J. McGraw, home; Chicago, F. Chance, first base; Pittsburgh, Fred Clarke, left field; Brooklyn, H. Lumley, right field; Boston, P. Somerville, first base; Philadelphia, Wilbert Robinson, home; Cincinnati, Clarke Griffith, home; St. Louis, R. Bresnahan, catcher. American League—New York, F. Stallings, home; Detroit, H. Jennings, home; Chicago, F. Jones (?), center field; Philadelphia, Connie Mack, home; Cleveland, N. Lajoie, second base; St. Louis, J. McAleer, home; Boston, Fred Lake, home; Washington, J. Cantillon, home.

Pitcher Fromme, the veteran traded to Cincinnati by St. Louis, recently hurled a 3-0 game. Pitcher Fromme always was a good hurler.

Tom Longdoz, the phenomenal Indian runner, was reported recently. Paragraphers are now expected to get busy with jokes about wedding invitations and matrimonial Marathons.

Captain Mike Donlin should keep one thought in mind while he is shooting to pieces the members of the club on their Southern training trip this spring (simply because he can make more easy money at the time playing vaudeville debut), namely, that his value as a varsity hit next season will draw more money to the box office should he manage to keep good playing during the coming season than if he makes a fool play on the diamond. And, Mickey, if you pay heed, how many fans do you think will attend games to cheer you on account of your notorious antics?

From Chicago comes the news that there will be no more diamond medals for winning world's championships. The national association, unable to please the ball players, has decided to abandon the custom of rewarding future champions. Hereafter, instead of presenting the various members of a championship team with medals, the association will give the owner of the winning club $100 with which to purchase a gold plate to be hung in the club's office or the players' clubhouse. Baseball fans who know how little players care for money will appreciate the enthusiasm with which this new proposition will be hailed by the kings of the diamond—not.

Homer Smoot, the founder of the spit ball, who played last season with the San José outlaw club, has asked us to be reinstated that he may rejoin Brooklyn.

You say one knows as what has become of that awful charge that baseball tried to corrupt Umpires Klem and Johnstone, and which was supposed to be under investigation by the officials of the National League? If the latter would tell us the truth, we mean we would all be able to have a good laugh.

Johnny Evers, the popular second baseman of the Chicago Cubs, champions of the National League, was married recently.

A canvass was recently made of the fifteen managers of the National and American League clubs. Only sixteen of the number claimed that their charges stood a good chance of winning the pennants in their respective organizations the coming season. This is the first sign of spring.

The best wishes of every fan in the baseball world are with Roger Bresnahan in his attempt to make a pennant winner out of the St. Louis Nationals. It is possible that Mack's task is one he may succeed in a year or so. Remember that the Cubs were not always the champions that they have been for the last few years, and that with Johnny McGraw and half of the Giants they had a fast team as about all the kinky players executed for last half playing.

Connie Mack has signed a player of great promise for the Athletics. His name is McInnis, and two years ago he was a high-school boy. Last year he took part in fifty-two games for the Haverhill Club of the New England League, and finished with a batting average of .360 per cent. and a fielding average of .950 per cent.

The comedy "Babe" Waddell, the Vaudeville of the baseball stage, is now wearing himself and the natives of the middle West by playing award as an indoor football team that makes the management in St. Louis.

"Jonahan Hunted and Nine is going to be a great year for baseball. It has two nines in it."—Judge. Both McGraw and Chance claim there is nothing in this statement and state that there will be but one nine, but their well-known modesty prevents their saying it.

Harry Sullivan, the well-known State College athlete, now a member of the New York Americans, is considering of retiring from the game. He may accept a fatherly position in a California school.

John Dahl is on the list from which Hedges will pick out the eight men he needs for the Browns during the coming season.

Hugh Jennings, in addition to being a baseball manager in summer and a lawyer in winter, has added backing to his varied list of accomplishments. He is now a director in the Old Forge Bank, in a Scranton suburb.

Joe Thomas, the heavyweight barkeeper, who was sold by Detroit to the Athletics, says that he has changed his mind about returning to join the Main brigade, and will do so, provided he does not purchase a ball club. Joe will not say what team he is affiliated to understand that he is after a Connecticut League club.

Eugene Van Orden retires professional by Connie Mack for the Athletics, but the New York State League had means to arrange with the aspirational average of .333 for eighty-odd games.

F. A. G.

A PRIZE-WINNING CAT AND ITS LUCKY EXHIBITOR

A PAIR OF CATS AND THEIR PROUD OWNER

ATTRACTIVE FIGURES AT THE CHICAGO CAT SHOW.—Photographs by A. P. Marsh.

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BUTTER MAKING CONTEST
HONEY DEW
SIGNOR ANT THE STRONGEST ANT ALIVE CHALLENGES ALL COMERS
FIRST PRIZE FOR GREATEST GAIN IN WEIGHT SEASON
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"COURAGE BOYS, DINNER WILL SOON BE READY"

A SHUTOUT

WITH A CENTIPEDE USING A DOZEN BATS, A DADDY LONG-LEGS COVERING TWO BASES AT ONCE, A PORCUPINE STEALING 2D SECOND WITH NO ONE DARING TO TOUCH HIM OUT, AND A PARROT TALKING DOWN THE UMPIRE, WHAT CHANCE HAS THE GOOD OLD HOME NINE, ANYHOW?

THE DEMON OF INTEMPERANCE REACHES BEETLEBURG.

THE DEMON OF INTEMPERANCE REACHES BEETLEBURG.

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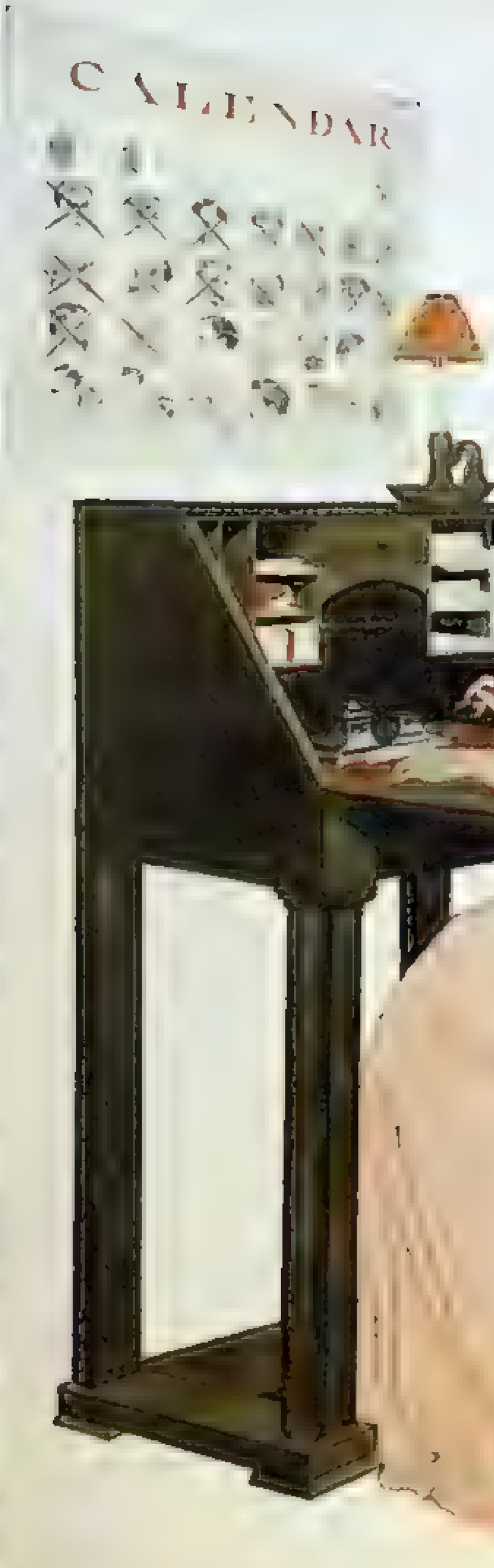

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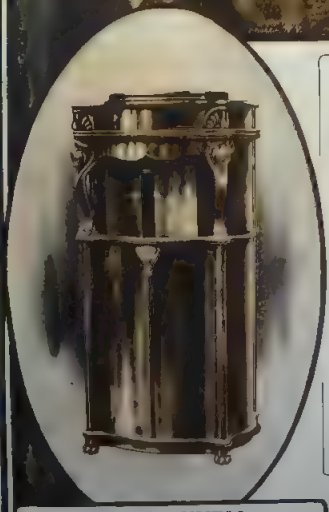

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BY WILLIAM T. HORNADAY

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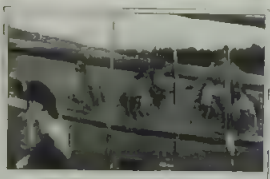

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September
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An Actress and Her Farm By Blanche Bates

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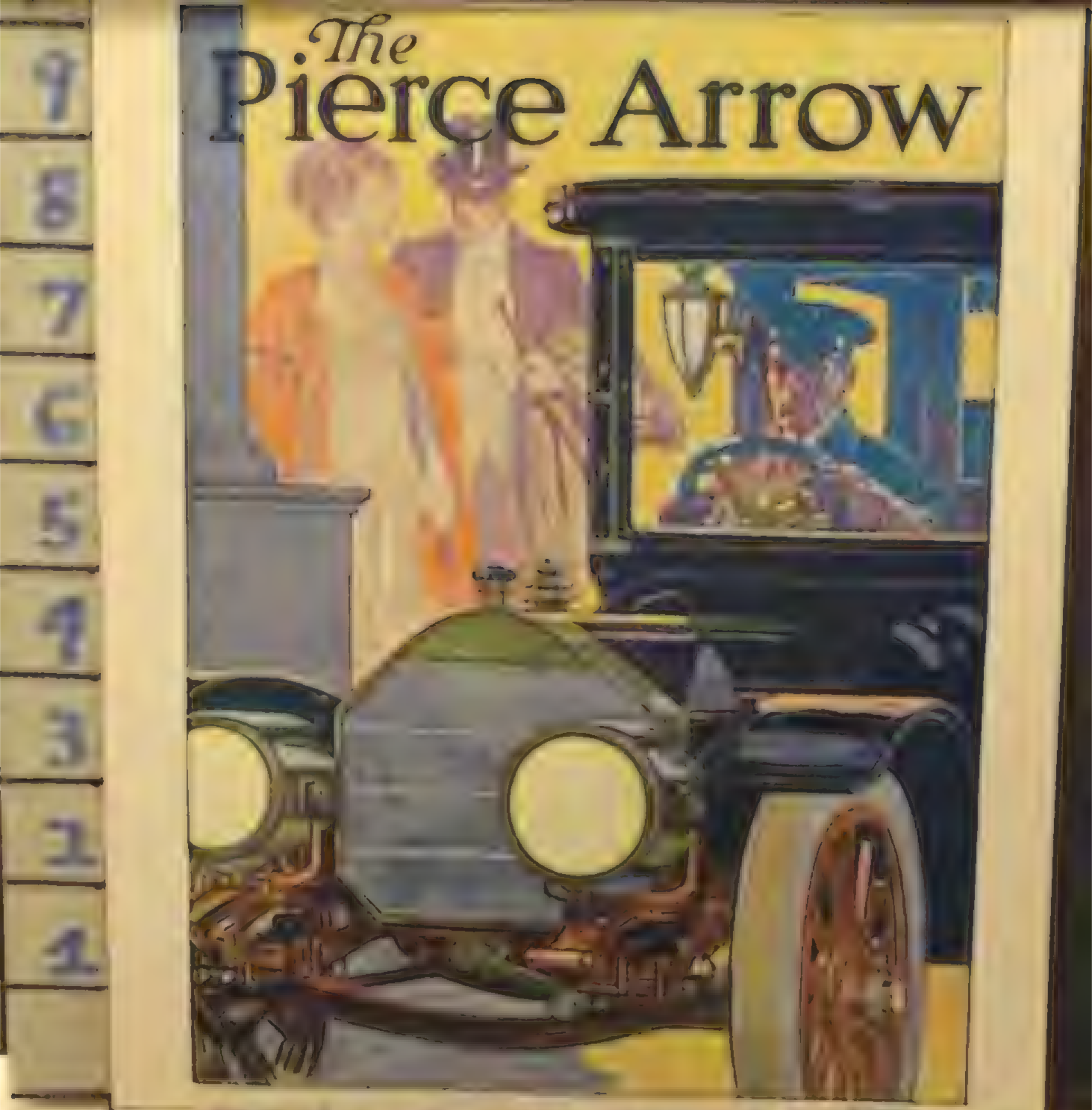
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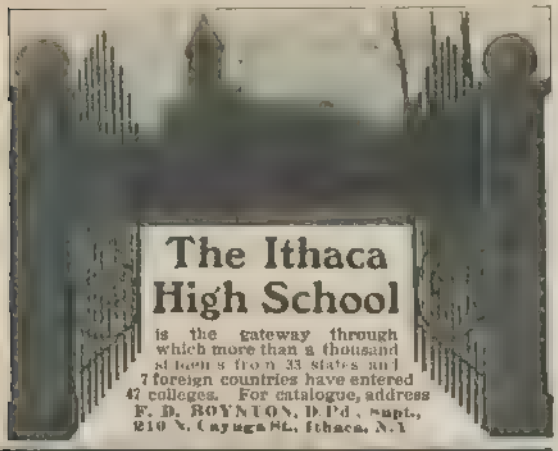

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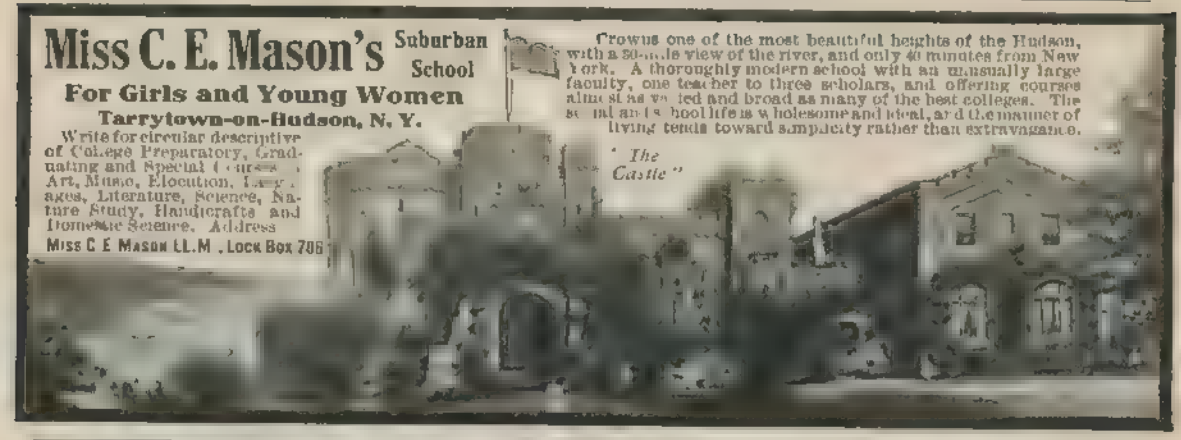
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1969

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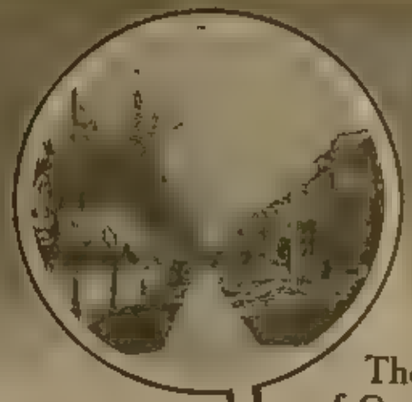

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# The Keystone "Six-Sixty"

The Munch-Allen Motor Car Company, with factory headquarters at DuBois, Pa., are placing a line of six-cylinder cars on the market, known as Keystone Sixes, that are claimed to be made of the highest grade of material obtainable and which are assembled and tested with the utmost care. . complete forging, with dropped center and spring pads, allowing a very low car and straight line drive. The rear axle is of the semi-floating type running on long roller bearings with ball thrusts and fitted with four internal and external brakes, 14 in. in diameter with a 2-in. face and actuated

Fig. 1 The new Keystone "Six Sixty" Motor 6-cylinders, 4½ by 5 water cooled, 51 H. P. on the brake at 1500 R. P. M. Dual ignition system, wheel base 122 inches, tread 56 inches, tires 36 by 4, double set of brakes on rear wheels, hot pressed steel frame force feed lubrication, multiple disc clutch, selective three speed and reverse sliding gear, shaft drive. Roadster or baby coupeau $2250.

The foremost in the line is a 60 H. P. car fitted with all up-to-date accessories such as Bosch high tension magneto, integral oiling system, multiple disc clutch, brake equalizers, etc. This car has a pressed nickel steel frame 163 in. long with a 4½-in. side member which is narrowed in front and fitted with a sub-frame to carry both motor and transmission. The frame is connected to the axles by means of four half elliptic springs; the front ones being 36 in. long and the rear ones 50 in. long and all 2-in. wide. All spring eyes are bronze bushed.

The front axle is an I-beam, made of one through equalizers allowing an unequal adjustment of brakes without affecting the equality of pressure on either drum.

### THE 6-CYLINDER MOTOR

The motor is composed of six individual cylinders with valves on either side, which allow a very large valve, 2¾ in. in diameter, which gives a large range of speed. It is claimed from 125 to 2000 R. P. M. loaded have been obtained from this motor, giving a car speed range of from 4 to 65 miles per hour; and some of the motors have accelerated as high as 2318 running light.

Fig. 2. View of the "Six Sixty" Keystone motor. Cylinders cast separately, valves on the opposite side, these valves being 2¾ inches diameter. Note the double system of exhaust pipes giving rapid egress of the exhaust gases. The bore is 4½ inches and the stroke 5 inches. Twelve plugs are used in connection with Bosch magneto and battery and coil. Fan is ball bearing.

The crank shaft is made of nickel steel 1⅞-in. in diameter and runs on seven die cast bearings with positive lubrication to each bearing as well as each piston.

Cooling is by water circulation through integral cylinder jackets with forced circulation by means of a large gear pump. This is aided by a large square tube radiator and ball bearing fan.

The drive is through an enclosed single joint and then by an enclosed pinion shaft to the bevel gears which are four pitch and 2-in. face. A bevel gear differential is used

CONTROL.

Steering is by worm and complete gear with inclined post, fitted with an 18-in. aluminum webbed wheel on which are

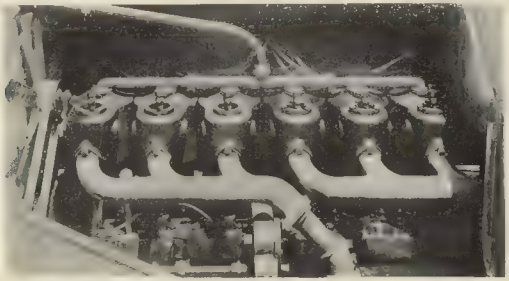

Fig 3 Keystone "Six Sixty" with low baby tonneau body. Note the back set left front seat giving the driver plenty of room. Wheel base 122 inches, tires 36 by 4, quick detachable

A clutch of the multiple disc type is enclosed in drum bolted to fly wheel; and owing to the fact that this is oil tight and dust proof, it allows the 32 conodial discs to run in a continual bath of oil.

Transmission is by sliding gear giving three speeds forward and reverse, the shafts and gears of which are made of chrome nickel steel and mounted on adjustable Timken roller bearings of ample size. This gear is fitted with a positive interlocking device that only allows gear change when the clutch is disengaged and also prevents clutch engagement when the gears are out of mesh

Fig 4 Front view of the Keystone "Six Sixty" showing the pleasing hood outlines and the front axle and springs

mounted the spark and throttle levers on a stationary quadrant. The service brake and clutch are actuated by pedals with adjustable pads, and emergency brakes and gear change by side levers. An accelerator pedal is fitted for use in traffic and rough roads.

The wheel base of these cars is 122 in. and 36 x 4-in. quick detachable tires of any make are fitted.

The regular body equipment is a four or five-passenger baby tonneau with a back set left front seat, allowing the driver freer movement. A two or three-passenger roadster body can also be had.

All cars are fitted with double ignition systems with 12 spark plugs all on the inlet side of the motor to prevent fouling. The usual light, horn, tool and tire equipment is supplied, and the weight is 2,550 pounds. A liberal guarantee against defects in workmanship and material is given and the cars sell at $2,250 complete.

The company is also placing a light six-cylinder car of high grade material and workmanship on the market, which will have 34x3½-in. tires, 117-in. wheel base, magneto, disc clutch and selective gear set; which will be driven by a 35-40 H. P. motor and weigh but 1,900 pounds complete. The details and price of this car will appear in a later issue of this paper.

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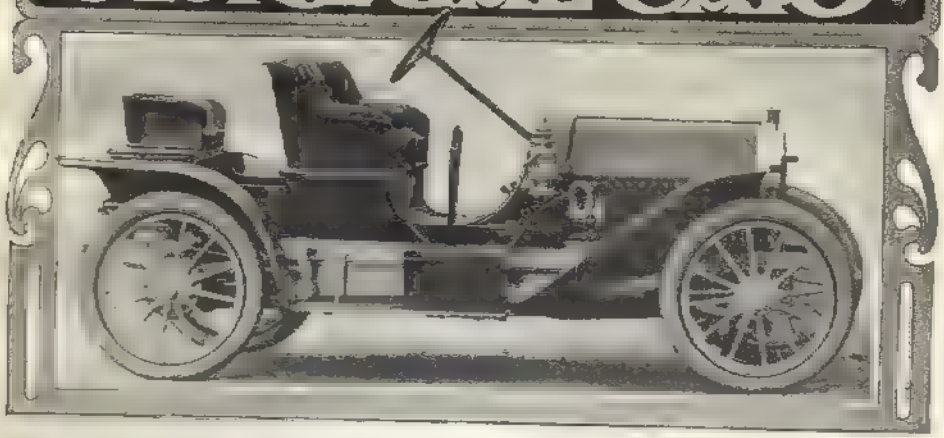
The American Sales Company, of Atlanta, Ga., will build a 4-cylinder $500 car for 1910.

# The REGAL CARS



The Regal Motor Car Company, Detroit, Mich., presents to the discriminating public the two latest Regal cars, Model "A" Touring Car and Model "B" Runabout for 1909.

This company's idea is to build a high grade car in every respect and place it on the market at a reasonable price. These new models have been in preparation for a number of months and it was first intended to put the same on the market at a higher price but it was soon found, however, by producing these cars in large quantities they could be marketed at a smaller profit and manufactured at the standard price, $1,250. The first shipment was made a couple of weeks ago and the production is rapidly increasing in the company's plant. The same chassis is used for both the Model "A" and Model "B," the only difference in the two being in the slant of the steering post.

The power plant consists of a four-cylinder, four-cycle vertical type engine, the bore and stroke being four inches. All of the valves are interchangeable and located on the left side of the engine. They are of large diameter and provide for a free inlet of gas to the cylinders.

The cam shaft is a single piece forging with all bearings case-hardened and ground to size. The crank shaft is also a single piece forging with all bearings ground. The bearings both for cam shaft, crank shaft and connecting rods are die cast under pressure and are ample in size to insure long life and quiet operation.

The cylinders are cast in pairs with integral water-jackets. The upper and lower parts of the crank case are separate—the lower being easily removed for adjustment of connecting rods. Supporting arms are cast on the upper crank case which hold the engine rigidly to the frame.

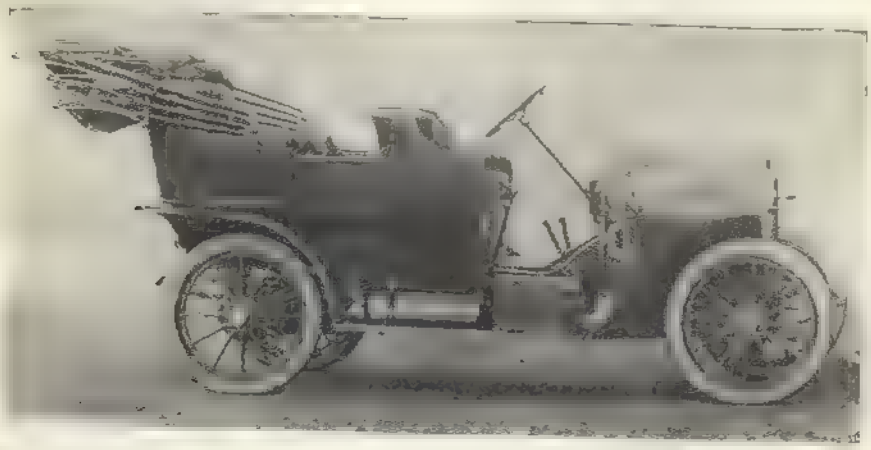


Fig. I. 1909 Regal Model A. Motor, 4 cylinders, 4x4 Cylinders cast in pairs. Die cast Babbitt bearings; force feed lubrication from gear-driven pump. Jump spark ignition from Remy high tension magneto

The well known transmission axle has been continued in these models. The transmission has three speeds forward and one reverse. It is a selective type and is combined with the rear axle housing making a complete unit construction and insuring complete alignment of gears under all conditions. The transmission will be operated entirely on ball bearings and the bearings in the rear axle are of the well known Hyatt roller type.

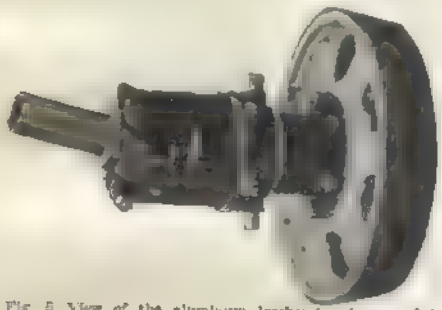


Fig. 5. View of the aluminum leather faced cone clutch and universal joint used in the 1909 Regal cars. Flat springs are inserted beneath the leather to insure gradual engagement.

The drive shaft is direct from universal joint to bevel gear. The rear end of the drive shaft is enclosed in the propeller tube. The front axle is of the tubular type following a well known European construction, the drop being outside of the spring seat. The spring is therefore set on the lowest part of the front axle which not only makes a low racy appearing car, but provides ample clearance for any condition of roads.

The brakes are four in number operating entirely on brake drums on the rear wheels, the pedal operating the internal expanding brake and the hand lever controlling the external contracting brake.

The frame is of pressed steel and is dropped over the rear axle. Semi-elliptic springs are used in front and full elliptic springs in the rear. The front springs are provided with rebound clips and both front and rear springs are of ample length to insure very easy riding.

The wheel base of the car is 105 inches. The weight has been reduced as low as possible and still leave a factor of safety in all parts. The weight of the touring car will not exceed 1900 lbs. and the weight of the runabout is 1825.

Besides the models herein described the Model "C" will be continued as a taxicab, and the Model "E" is fitted with a toy tonneau body.

The Regal Motor Car Co. has largely increased their manufacturing facilities for 1909 and expect to turn out two thousand cars during the season. By the addition of over 50,000 square feet of floor space, ample room is provided. The plant has been working twenty-four hours per day on these new models for over a month. The entire car is of their own design and construction and is not built from standard parts. There is nothing new or freakish in the product of the Regal Co. Every part of the Regal models it is claimed have been thoroughly tested out and proven to be commercially perfect in every way before being placed on the market.

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## SOME DETAILS AND CHANGES IN THE BUGGYAUT

While generally built as a high wheeler, the extreme simplicity of the Duryea Buggyaut mechanism has caused some buyers who prefer air tires to ask for it thus fitted. The cut herewith shows it with 36-in. x 3½-in. rears and 30-in. x 3-in. fronts. A comparison of the riding qualities of the two rigs otherwise identical shows very little difference between the large wheels with solid tires and the smaller wheels with pneumatic tires at speeds up to fifteen or eighteen miles per hour. Above this the difference is perceptible and the easy riding in favor of the air tires.

The engines with which these Buggyauts are fitted were formerly of the three port, two-cycle type, but an extended comparison during the past year has shown decidedly better results from engines using a check valve inlet to the crank case; one of the advantages being greater flexibility particularly at low speeds. A well-known advantage of the two-cycle is its low speed torque which does not decrease under throttle as rapidly as it does in the four-cycle engine.

Nickel finish is used on all bright parts as the maker believes that Buggyaut buyers are seeking for practicability and the nickel being almost untarnishable looks better in daily service with less attention than does the more common brass finish.

The Duryea grooved roller drive attracted much attention from engineers and mechanical men at the Palace show. It consists of two grooved rollers on each of the projecting ends of the motor shaft. These are adapted to mesh with large driving rings attached to the wheels. Swinging the motor forward brings the large rollers in contact with the large rings, giving high speed forward and driving the vehicle by rolling contact practically as the drive wheel of a locomotive pulls the train by contact with the rail. Swinging the motor to the rear throws the small roller in contact with the reverse ring giving reverse at reduced speed. The ends of the motor shaft are telescopic and by pressing the pedal the rollers can be thrown laterally inward after which swinging the motor to the extreme forward position brings the small roller into contact

The WORD "C"

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OUR COMPETITORS WILL TELL YOU this organization the score of experts who compose the E-M-F-"All Star Cast"—is the highest priced group of men in the automobile business. And that's a fact. No man who knows—who knows, mind you—any branch of automobile designing or manufacturing or selling is too high priced for us. We've scoured the industry for brains—mediocrity, however, finds no market here.

THAT'S WHY THIS IS THE CHEAPEST organization of which the industry can boast—not a man in it who guesses, who experiments -all know. They don't make mistakes. We are not buying experience at retail, as others do—bought all there was at wholesale and the cost stopped there.

DID YOU EVER KNOW A CAR that fulfilled to the letter every promise made for it as the E-M-F-"30" has done? Ever read more glowing promises—more extravagant claims? We trow not. What then of the car that can and has made good every promise, every claim? Must it not be a truly wonderful product?

COULD ANY BUT THE BRAINIEST BUNCH OF MEN have produced such a car? Has there been a fall-down anywhere? A weak point developed? Not one. There are to-day over 500 of them on the road. The reports from enthusiastic dealers and delighted owners put to shame the most glowing advance predictions of our advertising department.

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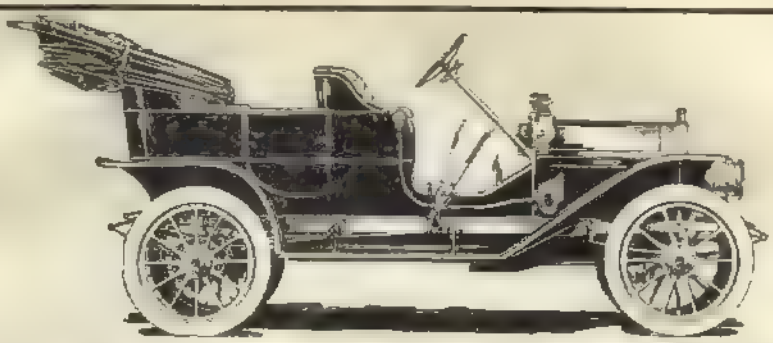

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THE MEN WHO COMPRISE THAT "ALL STAR CAST" have lived through and profited by, all the experience there has been in bringing the one-time crude contraption—the motor car—to its present high state of perfection.

EVERY MAN IS A RECOGNIZED SPECIALIST in his particular department. Each is peculiarly fitted to the position he occupies so that none competes with another—all collaborate for the perfection in detail, and the general excellence of the product.

THE NET RESULT OF ALL THIS TALENT—this experience dating from the infancy of the industry—is incorporated in the E-M-F-"30" car—the most highly developed, the most uniformly excellent product that is or can be produced by the industry to-day.

THEN CONSIDER THIS other advantage we have over all others. The E-M-F-factories—in which are manufactured every part of the E-M-F-"30" car are, we honestly believe, the most highly specialized as to equipment, the most up-to-the-minute in methods of handling and machining material, of any in the world.

IN AN INDUSTRY SO YOUNG and in which such radical changes and such tremendous strides have been made in the last two years, you can perhaps appreciate how obsolete is a plant equipped only two years ago. Most of them are five years old. Why they cannot, when compared with this magnificent new equipment, be called automobile factories—they are merely overgrown machine shops.

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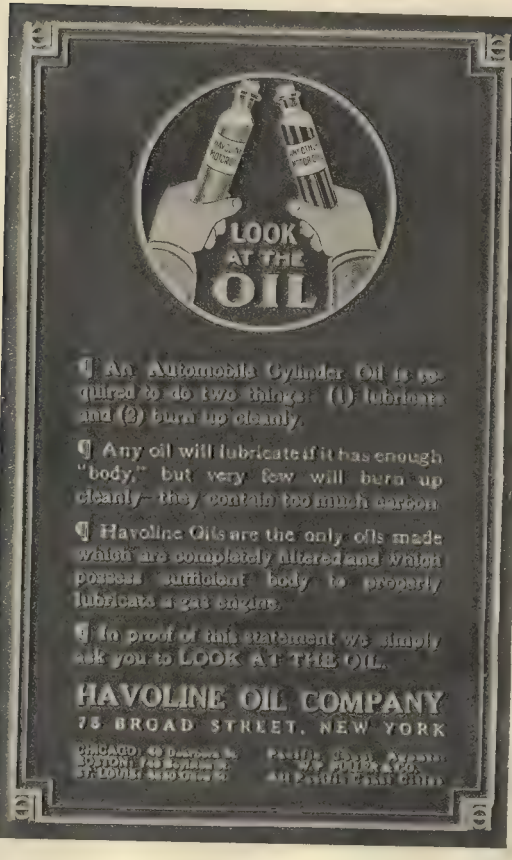
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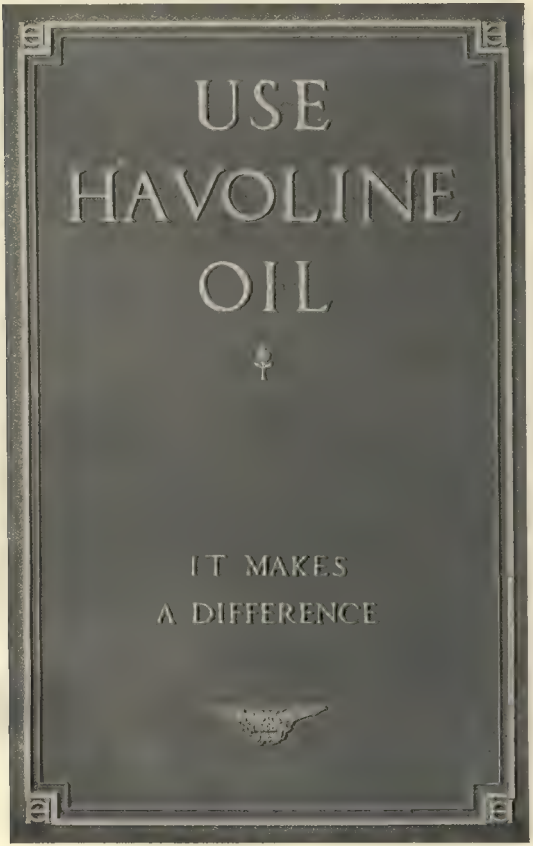
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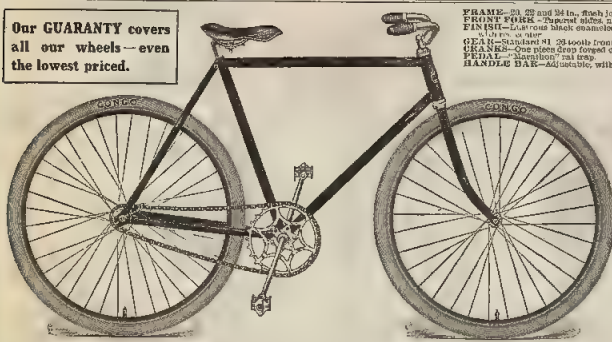
See next page for our liberal guaranty.

## The "MARATHON" (Guaranteed Tires, Shelby Seamless Tubing, Complete with Tool Bag and Outfit) $13.90

**Best bicycle ever offered for $13.90.** Not a "cheap" wheel in any respect except price. Ranks with the wheels the retail mail order houses call "high grade." 1-inch, 20-gauge Shelby seamless tubing throughout, flush at joints. Frame treated with coat of Anti-Rust and THREE coats of enamel. Honest in construction and thoroughly good in appearance.

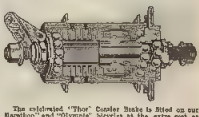
Same liberal guaranty as on our higher priced wheels.

**Our GUARANTY covers all our wheels—even the lowest priced.**




**FRAME**—21, 22 and 24 in., flush joints and reinforced at all connections.
**FRONT FORK**—Tapered sides, nickeled forged crown, strongly reinforced stem.
**FINISH**—Lustrous black enameled with red spear head, rims enameled in black with white stripe.
**GEAR**—Standard 81 26-tooth front and 9 tooth rear sprockets.
**CRANKS**—One piece drop forged oval pattern 7 in
**PEDALS**—"Hamilton" rat trap.
**HANDLE BAR**—Adjustable, with wood leather grips.
**SADDLE**—Troxel, padded.
**HUBS**—Improved bar shape.
**WHEELS**—Standard 28 in., 32 spokes front, 36 rear.
**TOOL BAG**—Leather, with pump and repair outfit.
**TIRES**—Guaranteed "Conco," Maltese single tube.

| | | |
|---|---|---|
| K78—Men's 20 in. without brake. | Each, | $13.90 |
| K80—Men's 22 in. without brake. | Each, | $13.90 |
| K82—Men's 24 in. without brake. | Each, | $13.90 |
| K79—Men's 20 in. with Thor coaster brake. | Each, | $16.75 |
| K81—Men's 22 in. with Thor coaster brake. | Each, | $16.75 |
| K83—Men's 24 in. with Thor coaster brake. | Each, | $16.75 |

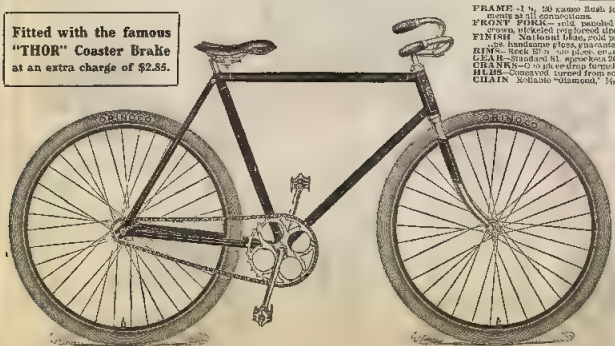


The celebrated "Thor" Coaster Brake is fitted on our Marathon and Olympia bicycles at the extra cost as stated

## The "OLYMPIA" (High Grade Finish, Expensive Equipment, Guaranteed Cactus-Proof "DRINCO" TIRE) $16.50

**A highest grade wheel at a fair price.** Superior to nine wheels out of ten jobbed at a higher cost. It is not possible to put more **quality** into a bicycle than goes into the "Olympia." A wheel of high tone—light, strong, graceful and clean cut. Frame of Shelby seamless tubing one inch, flush joints. Three coats of enamel over Anti-Rust.

**Fitted with the famous "THOR" Coaster Brake at an extra charge of $2.85.**




**FRAME**—1 in., 20 gauge flush jointed Shelby seamless tubing, fish tail reinforcements at all connections.
**FRONT FORK**—solid panneled tapered sides, nickeled diamond drop forged crown, nickeled reinforced tips.
**FINISH**—National black, cold panneled throughout, full nickeled fork crown and rims, handsome gloss, guaranteed not to peel or chip.
**RIMS**—Rock Island one piece cold formed Diamond Blade, gold striped.
**GEAR**—Standard 81, spur sprockets 26 tooth front, 9 tooth rear
**CRANKS**—One piece drop forged oval pattern 7 in.
**HUBS**—Concaved, turned from solid bar, most durable built.
**CHAIN**—Reliance "Diamond," ½ in. pitch.
**PEDALS**—"Olympia" rat trap.
**HANDLE BAR**—Shinee forward extension, adjustable, with wound leather grips.
**SADDLE**—Triumph Troxel with brass springs, padded.
**TOOL BAG**—Leather, with pump and repair outfit.
**WHEELS**—Standard 28 in., highly nickeled heavy spokes, 32 front 36 rear.
**TIRES**—Our thoroughly tested anemia proof "Drinco" single tube, one of the most satisfactory tires ever placed on a bicycle. **Fully guaranteed.**

### MEN'S "OLYMPIA."

| | | |
|---|---|---|
| K84—22 in. without brake. | Each, | $16.50 |
| K86—24 in. without brake. | Each, | $16.50 |
| K85—22 in. with Thor Coaster brake. | Each | $19.35 |
| K87 24 in. with Thor Coaster brake. | Each, | $19.35 |

### LADIES' "OLYMPIA."

Same specifications, finish and equipment as man's only drop frame, 6¾ in cranks, 22 spur, 28 front and 10 tooth rear sprockets. Equipped with cloth skirt on rear wheel when ordered.

| | | |
|---|---|---|
| K88—20 in. without brake. | Each, | $17.50 |
| K90—22 in. without brake. | Each, | $17.50 |
| K89—20 in with Thor Coaster brake | Each, | $20.35 |
| K91—22 in with Thor Coaster brake | Each, | $20.35 |

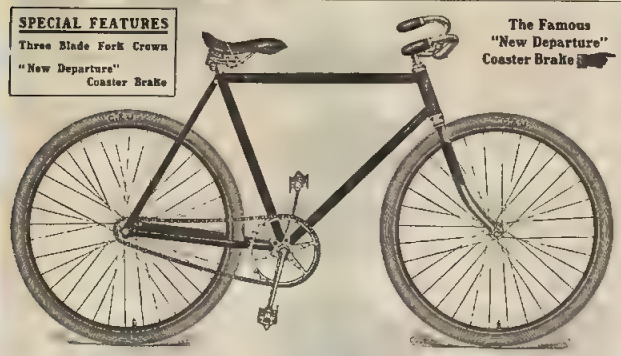
# The "ROYAL ROADSTER" (The Aristocrat of Bicycles Famous "G & J" Clincher Tire) $19.75

**Built especially for us,** to meet the demand from some of our trade for the BEST. Just the wheel for the fastidious rider who is willing to pay a little more to get something better than merely good. Lightest weight consistent with maximum strength. Aristocratic finish—patrons Brewster green, with gold spear head, centre frame gold panel striped. *The factory cost of the "Royal Roadster" is at least as high as that of the highest priced agency wheels.* You can pay more but you will not get a better or a nobbier bicycle.

**SPECIAL FEATURES**

**Three Blade Fork Crown**

**"New Departure" Coaster Brake**



**The Famous "New Departure" Coaster Brake**

Fitted on our "Royal Roadster" wheels at an extra cost of $2.10.

Notice the 3 blade fork crown

Showing sprocket of the "Royal Roadster"

**FRAME**—20, 22 and 24 in., flush jointed 1 in. 20 gauge Shelby seamless tubing specially reinforced at all connections.

**FRONT FORK**—Three blade fork crown, nickel plated, tapering arches with nickel plated and reinforced tips.

**FINISH** Luxurious Brewster green enameled with gold spear head centre frame gold panel striped. Finish fully guaranteed.

**WHEELS** Standard 28 in. G & J one piece rock elm rim enameled green and gold striped, best wire spokes, nickel hubs and nickeled steel flanges high shell ball bearings.

**GEAR**—Standard 81, sprockets 20 tooth front, 9 tooth rear.

**CRANKS** Arch pattern, drop forged diamond pattern, 7/16 in. centre, extra wide shaped, drop forged and cut, nickel plated ends.

**CHAIN**—The reliable "Diamond" 3/8x1 in pitch.

**PEDALS** Rubber rat trap.

**HANDLE BAR** Detachable forward extension, adjustable, with best leather grips.

**SADDLE**—Star Troxel with spiral springs, perfect design and comfort.

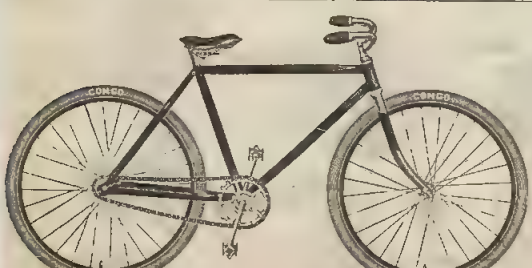
**TOOL BAG** Leather with pump and repair kit.

**TIRES** Goodrich 28, G. & J. Clincher, 2¼ in. will last twice as long as any other. Fully guaranteed.

| | | |
|---|---|---|
| K95—Men's 20 in. without brake. | Each. | $19.75 |
| K94—Men's 22 in. without brake. | Each. | $19.75 |
| K96—Men's 24 in. without brake. | Each. | $19.75 |
| K93 Men's 20 in. with New Departure coaster brake. | Each. | $22.85 |
| K92 Men's 22 in with New Departure coaster brake. | Each. | $22.85 |
| K97—Men's 24 in. with New Departure coaster brake. | Each. | $22.85 |

# The "CLIPPER JUNIOR" BICYCLES For Boys and Girls

Designed and constructed especially to withstand the hard usage "Junior" bicycles ordinarily receive. Practically duplicates of our "Marathon" wheels in equipment and finish. Gear 82, 20 tooth front sprocket, 9 tooth rear, 5½ in. cranks. The most durable and best constructed "Junior" bicycles manufactured. Complete with tool bag, pump and repair outfit.




### BOYS' JUNIOR

| | | |
|---|---|---|
| K75—18 in. frame, 24 in. wheels, 24x1¾, "Congo" guaranteed single tube tire. | Each | $13.90 |
| K76—18 in. frame, 26 in. wheels, 26x1¾ "Congo" guaranteed single tube tire. | Each. | $13.90 |
| K77—With Thor coaster brake, otherwise as K76. | Each. | $16.75 |

Note—For the boy or youth tall enough to ride a 26 in. bicycle we call attention to numbers K76 and K79 "Marathon" also K82 and K83 "Royal Roadster." While standard full size men's models they often meet the demand of the tall youth.

### GIRLS' JUNIOR

| | | |
|---|---|---|
| K74—18 in. drop frame, 24 in. wheels, 24x1¾ in. "Congo" guaranteed single tube tire, rear wheel mud guard. | Each. | $14.50 |

## EXCLUSIVE AGENCY

To any merchant willing to push wheels vigorously, we are prepared to make an interesting Exclusive Agency Proposition whereby he may control sales in his town.

If interested, write us for particulars which will go forward by return mail.

## SINGLE TUBE TIRES ARE BEST.

Tire showing "Congo" single tube in use on our Marathon wheels.

The tire shown at the left is the "Orinoco" tire in use on our "Royal Roadster" wheels.

We believe that single tube tires are more satisfactory both to manufacturer and rider than double tube.

With a "Congo" or an "Orinoco" casing proof tire a puncture can be repaired in an instant with the aid of the 6x4 needle top tube filled with pigskin. No chimney cement to lug along—no scrambling life to pieces—no more spoiled clothes.

After a "Congo" or an "Orinoco" has worn out as a single tube, it can be made into a double tube and will yield another season's wear.

## GUARANTY

Any part which may prove defective in workmanship or material, we agree to replace without charge when such part is returned to us charges prepaid, on or before December 1, 1900.

We guarantee tires against any defect in workmanship or material but cannot replace any on account of becoming punctured or blown out.

Repairs must come to us through the merchant, not the rider. Charges to be prepaid as is the accepted trade custom. We will not make allowance for repairs made locally.

# Sad Irons

COMMON

Sharp or Round Point

Per Pound ..... $ 0.07
Weights 4, 5, 6, 7, 8, 9 and 10 lb.
In Bulk

MRS. POTTS

Set Consists of 3 Irons, Handle and Stand

| No. | | Per Set |
|---|---|---|
| 50 | Nickel Plated, Tinned Top | $ 2.50 |
| 55 | Polished, Tinned Top | 2.25 |

Six Sets in a Case

# Sad Iron Handles

For Mrs. Potts Iron:

| No. | | Per Doz. |
|---|---|---|
| 20 | Tinned Cast Iron Stretcher | $ 1.50 |
| 100 | Hazel Wood, Wrought Steel Tinned Stretcher | 2.00 |

Enterprise Best

| No. | | Per Doz. |
|---|---|---|
| B 10 | Tinned Forged Iron Stretcher, Best Selected Wood | $ 2.50 |

# Sensible Sad Irons

No. 1 Sleeve

No. 4 Toilet

No. 45 Tourists

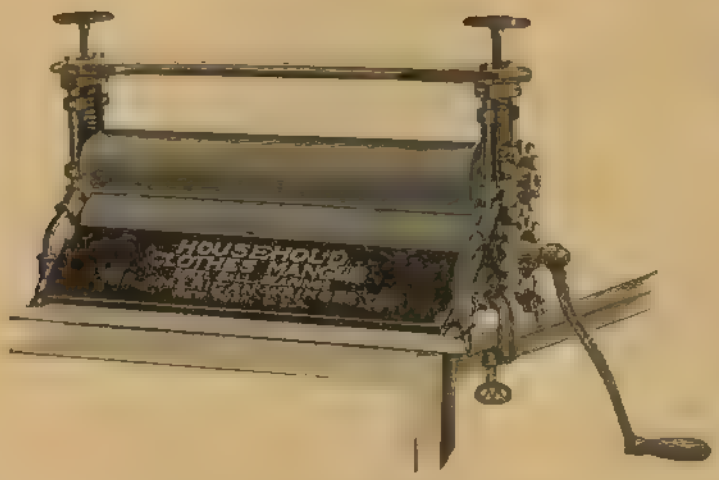
Nickel Plated, Aluminum Bronze Top

SINGLE IRONS

| | | Per Doz |
|---|---|---|
| 1 | Sleeve Iron, 7 in. long, Weight 3 lbs. each, with Handle | $ 6.50 |
| 4 | Toilet Iron, Weight 2¾ lbs. each, a Handle and Stand with each Iron | 6.00 |
| 45 | Tourists Iron, Weight 3¼ lbs. each, a Handle with each Iron | 6.50 |

One Doz. in a Case

# Mangles



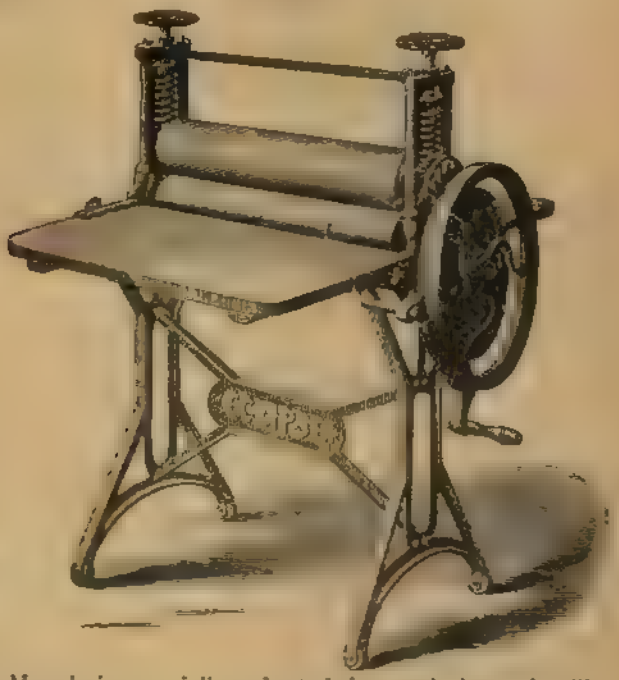

Hard Maple Rolls, Highly Polished

Articles Mangled retain their original whiteness, are more healthful than when finished by a hot iron (as the meshes of the material are left open) and are never spoiled by scorching. Suitable for Sheets, Towels, Pillow Slips, Table Cloths, Napkins and all Plain Pieces without buttons.

| No | Size Rolls | Each |
|---|---|---|
| 120 | 24x3 in. Plain Bearings | $8.00 |
| 124 | 24x3½ in. Ball Bearings | 9.00 |

Weight, Each, 70 pounds

ECLIPSE



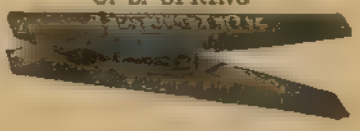
This Mangle is especially adapted for use in large families laundries and hotels. The gearing is covered by a shield to avoid accident to the user. The rolls are of selected hardwood. Pressure can be regulated by screws and springs at the end of the rolls. The double gearing makes easy turning.

| | Each |
|---|---|
| Eclipse | $50.00 |

Weight, Each, 300 pounds

# Clothes Pins

U. S. SPRING



| | Per Gross |
|---|---|
| U. S.–Clothes Pins | $ 1.50 |

One Gross in a Box

STANDARD

| No | Per Box |
|---|---|
| XXX–Standard Clothes Pins | $ 1.50 |

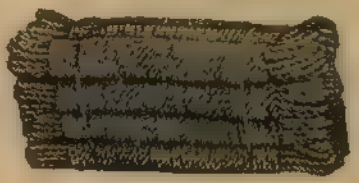
Five Gross in a Box

# Clothes Lines

TWISTED WIRE

| No. | 50 ft. | 75 ft. | 100 ft. |
|---|---|---|---|
| 18–Per Doz | $ 3.50 | 4.00 | 5.00 |
| 19–Per Doz | 3.00 | 3.50 | 4.50 |
| 20–Per Doz | 2.50 | 3.00 | 4.00 |

COTTON



**Standard, Braided**

| | Per Doz. |
|---|---|
| 40 Ft. Hanks | $ 3.00 |
| 50 Ft. Hanks | 3.75 |

**Bristol, Twisted**

| | Per Doz. |
|---|---|
| 40 Ft. Hanks | $ 2.00 |
| 50 Ft. Hanks | 2.50 |

One Doz. Hanks in a Bundle Two Connected

# Sensible Sad Irons Sets

No. 25

No. | Per Set
---|---
25–Set consists of Three Irons, One Handle and Stand ..... $2.00

Six sets in a box.

## Tailors Iron

No. 125

No. | Per piece
---|---
125–Tailors Iron, solid well finished practical Iron with Solid Twist Handle ..... $ 0.10
Weights, 12, 14, 16, 18, and 20 lbs.

## Charcoal Iron

No. 4

No. | Per doz.
---|---
4–Charcoal Self-Heating Iron Polished Cast Iron Base Removal, Cast Iron Top Plate and Chimney combined Hardwood Handle with Tin Heat Shield Adjustable Draft Hole Cover Weight 84 lbs per dozen | $20 00

One-half dozen in a box.

# Plumb Bobs

## STEARNS

No. 11

No. 12

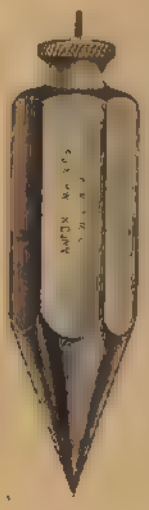
### Nickel Plated Iron

Accurately Made, Highly Finished

| No. | Weight | Per Doz. |
|---|---|---|
| 11 | 5⅓ oz. | $ 3.00 |
| 12 | 14¾ oz. | 4.00 |

One Doz. in a Box

## CAN'T ROLL



Nos. 10 and 20

### Hexagon Steel, Nickel Plated

Screw Top, Accurately Made, Finely Finished

| No. | Weight | Per Doz. |
|---|---|---|
| 10 | 7 oz. | $ 6.00 |
| 20 | 11 oz. | 8.00 |

One Half Doz. in a Box

# Plumb Bobs

No. 1

Nos. 0 and 00

Nos. 3, 6 and 18

Nos. 18, 28, and 38

**Cast Iron, Japanned**

| No. | Weight | Per Doz. |
|---|---|---|
| 1– | 9 oz. | $ 2.00 |
| 00– | 18 oz. | 4.00 |
| 0– | 42 oz. | 8.00 |

No. 1, One Doz. No. 00, Half Doz. in a Box No. 0, Loose

One-half Doz. in a Box

**Cast Brass, Steel Point, Screw Top**

| No. | Weight | Per Doz. |
|---|---|---|
| 5– | 6 oz. | $ 7.50 |
| 6– | 11½ oz. | 10.50 |
| 8– | 16 oz. | 12.50 |

One-half Doz. in a Box

**Stanley**

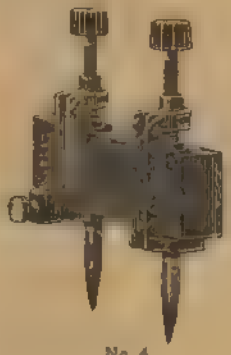
Adjustable, Steel Point, Complete with Line

| No. | Per Doz. |
|---|---|
| 1 S–Small, Bronze Metal | $ 21.60 |
| 2 S–Large, Bronze Metal | 25.20 |
| 5 S–Large, Iron | 12.00 |

One-half Doz. in a Box

# Trammel Points

Nos. 1, 2 and 3



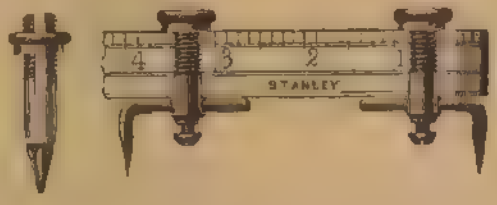
No. 4

With Steel Points

| No. | | Per Pair |
|---|---|---|
| 1– | Small, Bronze Metal | $ 1.50 |
| 2– | Medium, Bronze Metal | 2 00 |
| 3– | Large, Bronze Metal | 2 50 |
| 4– | Iron, Nickel Plated | 1 00 |

One Pair in a Box

# Rule Trammel Points

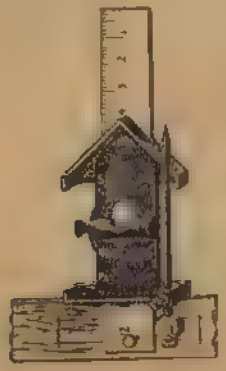



No. 99

Set consists of Two Brass Trammel Heads, with Movable Steel Points; and One Head with a Pencil Socket

| No. | Per Set |
|---|---|
| 99 | $ 0.60 |

One Set in a Box



# Odd Jobs

Ten Tools in One
including
Mortise Gauge, Marking Gauge, Depth Gauge, Plumb, Level, Try Square, Mitre Square, T Square, Scratch Awl, and 12 in. Graduated Rule
Nickel Plated

| No. | Per Doz. |
|---|---|
| 1 | $ 12.00 |

One-twelfth Doz. in a Box

# Shaving Brushes

## RUBBERSET
TRADE MARK

**Sectional View Shows Why the Bristles in a Rubberset Brush Won't Come Out**

The ends of the bristles are first carefully cleaned and sole between Soft Rubber. This bed is then pierced with a strong metal tool and the bristles are placed in the holes and vulcanized (hardened) under heat and pressure. **The result is a solid vulcanized head in which the bristles are so thoroughly anchored that it retains every single bristle until the Brush wears out. We guarantee** this Hard Rubber setting to withstand anything—hot water, cold water, soap or hard usage.

**Bristles are held firm there by Hard Rubber**

No. 400

Imported white bristles, non-corrosive metal ferrule and ebonized handle

| No. | Per Doz. |
|---|---|
| 400-. ... ..... ... | $3 00 |

No. 49

Bar[illegible] best white bristles [illegible] handle

| No. | Per Doz. |
|---|---|
| 49-1-Small size ... | $ 6 00 |
| 49-2-Medium size | 7 80 |
| 49-3-Large size .. | 9 00 |
| 49-4-Extra Large size .. | 12.00 |

No. 221

Pure [illegible] handle, ferrule highly polished

| No. | Per Doz. |
|---|---|
| 221-Medium size | $6.00 |

No. 222

Pure badger hair white bone handle, handle polished

| No. | Per Doz |
|---|---|
| 222-Medium size | $9.00 |

No. 214

Extra fine white French bristles, polished rosewood handle

| No. | Per Doz |
|---|---|
| 214-2-Medium size | $12.00 |

No. 215

Extra fine white French bristles, Albright ivory handles, highly polished

| No. | Per Doz. |
|---|---|
| 215-1-Small size | $12 00 |

Packed one in cardboard box, one-half dozen in carton

# Shaving Brushes

# RUBBERSET

TRADE MARK

No. 240

Pure badger hair white bone handle, cup-shaped ferrule prevents water and lather from running down on the hand when brush is in use

| No. | Per Doz. |
|---|---|
| 240–Medium size | $12.00 |
| 242–Large size | 18.00 |

No. 251

Pure badger hair white bone handle octagon shape highly polished

| No. | Per Doz. |
|---|---|
| 251–Medium size | $15.00 |
| 252–Large size | 18.00 |

No. 243

Pure badger hair, polished bone handle cup-shaped ferrule prevents water and lather from running down handle when brush is in use

| No. | Per Doz. |
|---|---|
| 243–Large size | $24.00 |

No. 260

Pure badger hair white bone handle octagon shape highly polished, cup-shaped ferrule prevents water and lather running down handle when in use

| No. | Per Doz. |
|---|---|
| 260–Medium size | $12.00 |
| 262–Large size | 18.00 |

No. 385

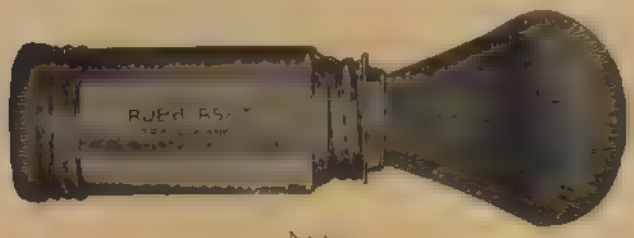
Pure badger hair, imported bone handle, highly polished

| No. | Per Doz. |
|---|---|
| 385 Large size | $30.00 |

No.

Pure badger hair white bone handle [illegible] polished

| No. | Per Doz. |
|---|---|
| 253–Large size | $24.00 |




No.

**The Tourist,** selected badger hair, heavy nickel plated handles, ends unscrew permitting brush to be completely inserted into the handle

| No. | Per Doz. |
|---|---|
| 373–Large size | $12.00 |

No. 371

**The Tourist,** selected badger hair, heavy nickel plated handle, ends unscrew permitting brush to be completely inserted into the handle

| No. | Per Doz. |
|---|---|
| 371–Small size | $9.00 |

Packed one in cardboard box, one-half dozen in a carton

# Studebaker MOTOR CARS

## If You Can't Get Good Roads Get a Studebaker-Garford Car

GOOD ROADS CARS AND FAIR WEATHER FRIENDS belong to the same category. Both are plentiful. But friends that can be depended upon in times of adversity or cars that can be trusted to take you through regardless of road or weather conditions are, sorry to tell, as scarce as hen's teeth.

STUDEBAKER-GARFORD CARS ARE FAMOUS for rough road performances. Don't hold many boulevard records. What few track records they do hold were made in twenty-four hour grinds—where stamina counts and where dependability wins.

IF YOU WANT A RACING CAR there are many from which to choose. If you are satisfied with a car that will skim along at a mile-a-minute clip over a smooth macadam road—why, their name is legion.

FUNNY, ISN'T IT, what a lot of sales are made on that kind of demonstration? Not one customer in a hundred would be willing to go a five-hundred-mile trip such as would really test a car—and show the superiority of Studebaker-Garfords—and yet everyone knows that many times, during the life of a car, it will be called upon to make such a trip and to encounter the worst possible road and weather conditions.

MOST MEN ARE SATISFIED with a little five-mile spin or possibly a fifty-mile jaunt over picked roads with an occasional refreshing stop at a roadhouse. What does such a demonstration prove as to the stamina of a car, or of it's riding qualities? Why, the hardest springs ever made won't tire you in a short ride But on a full day's trip over rough roads—that's where 55 years of experience in carriage-spring making counts. That's where Studebaker-Garford cars excel.

IF WE COULD ONLY INDUCE every prospective customer to take such a ride as we would suggest is necessary to prove the value of any car, we would save a world of money on demonstrations. Each demonstration would be costly—but every one would result in a sale. There would be no waste. But

how many prospective buyers would consent to ride all day on such a trip as the Studebaker-Garford "30" is making this week from Denver to Chicago?

BY THE WAY, WHY IS IT that when a newspaper like the Denver Post wants a car for a strenuous five-hundred or thousand-mile drive; having dozens to choose from for its great advertising –why is the Studebaker-Garford always selected? It's easy. Other cars may may, mind you accomplish the task. There's one that will with absolute certainty. And, to avoid the chance of a fizzle, that car is always chosen. And it's a Studebaker-Garford.

MANY SALES ARE MADE ON THESE TRIPS. It's the practice of our drivers to take along from point to point any persons interested and who are in the market for a car. It's about the only way we can get prospective customers to take what we call a real demonstration. And no one who has ridden a day or more on one of these strenuous trips ever will consider any other car.

A MAN WHO HAD RIDDEN TWO DAYS through Iowa Gumbo on a Studebaker-Garford car gave expression to the phrase with which this ad begins: "If You Can't Get Good Roads, Get a Studebaker-Garford Car." The millennium of good roads is yet a long way off. When it has arrived there won't be such a difference between Studebaker-Garford cars and a lot of others. But while present conditions obtain there's a wonderful difference.

IF YOU ARE IN THE MARKET for an automobile and you want a car that will prove a dependable friend in foul weather as well as in fair; that will afford you comfort on rough roads as well as on city boulevards; and if, before buying, you are willing to take a ride such as we like to lay out to prove the comparative qualities of Studebaker-Garford Cars and others —just say the word.

# Studebaker Automobile Co.

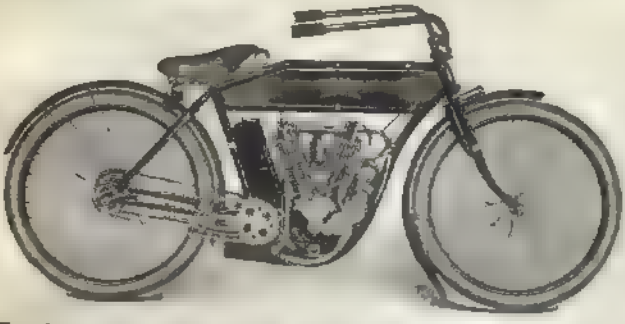
## MAIN OFFICE: Cleveland, Ohio

BRANCH OFFICES: New York, Boston, Philadelphia, Chicago, San Francisco, Stockton, Cal.; Sacramento, Cal.; Kansas City, Mo.; Portland, Ore.; Seattle, Wash.; Salt Lake City, Utah; Dallas, Tex.; Denver, Colo.

*DEALERS EVERYWHERE—5,000 of them—just say STUDEBAKER*

## The Get-At-Ability of

# THE INDIAN



Is a feature of utmost value to the rider. **IT DISCOUNTS DELAYS.** Every part of the **INDIAN** can be reached directly, without disturbing the rest of the machine.

**Features That Please the Rider Help the Agent—They Make Sales.**

**Sizes and Prices to Please All.** **Get Catalogue P.**

**HENDEE MANUFACTURING CO., SPRINGFIELD, MASS.**

# The One Big Book of Auto Supplies

## Now Ready

It covers everything for the Garage the Owner, the Car and the Driver

If you have not secured our 1909 Catalog, write today for Catalog S. 319

*IF IT IS USED OR WORKS ON AN AUTOMOBILE, WE SELL IT*

## Excelsior Supply Company

Established 1876 233-235 Randolph St. CHICAGO, ILL.

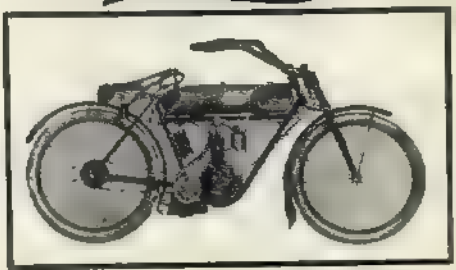
# 15,000

## THOR MOTORS IN USE TODAY

8 Years' Experience Embodied in

## Thor

Motorcycle



Supreme

*Room for More Agents. Write Dept. T.*

**Aurora Automatic Machinery Co., Aurora, Ill.**

# POST CARD HEADQUARTERS

**The up to the minute line.** Every really good thing the home or foreign makers can produce. So enormous has become our output that our four houses are far and away the largest distributers in America. Our prices and one trial lot of goods will show you what put us in the lead. You are not only sure of getting the very latest numbers but you can also average much better than usual profits.

**SOUVENIR POST CARDS.**

All cards regulation sizes, most will require. stamp of postal laws. **WE CANNOT PREPAY PACKAGES.**

a laugh, sentimental, patriotic, highly lithographed in many colors, heavy embossed views, worked in gold. Each with words and music of chorus. In box, assd. ..... Per 100, **55c**

variety subjects gold and silver backgrounds, poppies—poppies. Lilies of the valley, zinnias, chrysanthemums, pansies in box Per 100 **55c**

class art, juvenile, floral subjects in rich colors, each with printed title. High gloss finish, wide white border in frame

**8665—** "MOTHER."

ed 8 col or cards, profuse gold decorations assd. sentimental, color floral scenes, many subjects, 100 in pkg., assd . . . Per 100, **67c**

**BIG FLORAL ASST.**

*The kind that you can't keep in stock.*

**8786**—Big floral asst. Asstd. heavily embossed and new moire finish, bright natural colors, perfect in detail, lilacs, roses, violets, chrysanthemums, lily of the valley, etc. 100 in **40c**

d ve plastic colors portraying a beautiful cluster of flowers, such as roses, lilies of the va each having a ritiful colors

produce tions of 48 point inscriptions the

objects reproduced in natural colors by the three color

In box, asstd.

**"FLORAL" BIRTHDAY POSTCARD ASST**

*Including a variety of splendid sellers.*

**8693**—"New Floral" asst., 50 subjects, some embossed, gold, silver & white backgrounds, big variety Per 100 **65c**

**EMBOSSED COMICS.**

*A large asst. of the popular comic subjects.*

a laugh, included in th 48 subjects. 100 in box. Per 100. **60c**

ers, now colors, new work exquisite landscapes, bucolic views, marine scenes and still life, handsome etc. 100 in box . . . . . .

ent work etc.

Per 100, **45c**

**8021**—

ebiently finished

d pen work, et

ions, all of the valley, etc., natural color decoration on delicately tinted background, birthday greetings. 100 in pkg., asstd., Per 100, **65**

**8655**—

that usually sol pkg., assd

ing colorful poses, assd. plain and embossed gold scroll frame effects, gold ribbed backgrounds, etc. 100 in box assd Per 100, **69c**

**8807**— "Gold

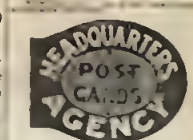
Landscapes and marine views during all the seasons, also new artistic and Marathon subjects, perfection of coloring, gold fancy embossed oval and beaded square frame assd. . .

Landscape and art nouveau designs. silver and delicately tinted backgrounds. 100 in box assd. . . . . Per 100 **75c**

**8805**— Easter, Mother's

In class lots selves, endless variety fast selling subjects, all orders

**OUTDOOR REVOLVING SIGNS.**




**81943**—"Post Cards," extra heavy metal, smoothly made, will stand the weather, very attractive, can be seen at a great distance. Center piece re

**BIRTHDAY POST CARDS.**

A line that sells every day in the year. You cannot afford to be without them. They are absolutely necessary if you wish to carry a full All have birthday greetings.

**"HIGHEST AWARD" ASST.**

*Without doubt the most elaborate and artistic series on the market*

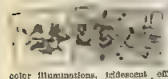
**70c**

## BIRTHDAY POST CARDS Contd

with greeting in script, envelope flap, with hand flowers, scroll embossed hand border, swastika ornaments. 100 in box, assrtd. Per 100, $0c

gold embossed back

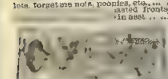
raised greetings, best quality board, 50 in assrt. Per 100, $1.75



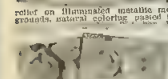
satin and metallic natural color illuminations, iridescent effect, gold traced greetings. 50 in box, assrtd... Each, 3c

tina, fancy ornamentals. Shaded back grounds, pasted fronts. Beautiful colorings 25 ... Each 3½c

lots, turquoise note peonies, etc.... ... mask in assrtd ... pasted fronts. Mask in ... Each, 3½c



relief on illuminated metallic moire Back grounds, natural colors, pasted front. Gold ... Each 4c



## 8809 — Mascot.

tucia, heavy ... trial of silk

1 in envelope, 20 in ... Each, 5½c

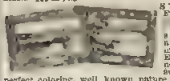
## AUTOGRAPH POST CARDS.

... card colors, beautifully ... fully shaded, 50 subjects— grapes and fruits 100 in box, assrtd. Per 100, 72c

"Items marked with a star in front of price as (★) are special at that figure for ... week ... ... engr.

## "STERLING" LINE AUTOCHROME POST CARDS.

Note prices carefully. These cards never ... lection on the market covering every available style. All cards worked in 12 colors, excellent finish. 100 in pkg.



8787 — Framed ... scapes, ... and ... marines. Entirely new ... subjects, each with artist's name, grain imitation wood effect frame borders. 100 in box...Per 100, $5c

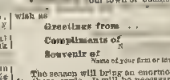
perfect coloring, well known nature studies, each with artist's name, grain imitation wood effect frame borders. 100 in box...Per 100, $5c

8801 — Yellow ... and ... Per 100, $1.50

Washington and Lincoln. 10 pictures of our famous Capitol. 100 in pkt.... ... Per 100, 68c

## OUR NAVY ASST.

*Ever popular patriotic specialities.*



all battleships in our Pacific Squadron, various armored cruisers and ... miniatures. Make a display of these which is National talk 100 **68c**

## TINSELED POST CARDS.

... our town or business. Price ... wish as ...

Greetings from ...

Compliments of ...

Souvenir of ...

Name of your firm or town

The season will bring an enormous demand for these cards. It will be necessary only for you to display some of them to have a big sale.

... you when mailed with your name and mailed to your women trade or given away as souvenirs on a special day sale.

Upon request we tinsel free as you may direct any four words you may wish.

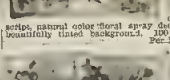
84 — Floral cards embossed and printed in natural colors. Each asst. contains many ...

## RAPHAEL TUCK'S FAMOUS POST CARDS.

So well known that further description is ...

... for all popular occasions

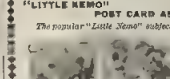
... scripts, natural color floral spray decorations, beautifully tinted background. 100 in box. Per 100, 68c



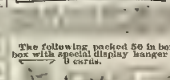
and forget me not decorations, delicately tinted, natural color, shaded background. 100 in box. Per 100, 68c

## "LITTLE NEMO" POST CARD ASST.

*The popular "Little Nemo" subjects.*



copyrighted juvenile cartoons showing the Nemo, Dr. Pill, Flip, King Morpheus and the rest of the Slumberland 14 colors Per 100, Cnt.



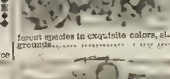
Hand-... 12

The following packed 50 in box. Each box with special display hanger showing ... cards.

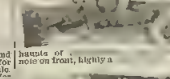
8781 Scenes From Dixie. Large variety subjects illustrating southern life and plantation ...

8782 Natural ... Series. Illustrating bird and insect life, perfect nature ... Box, 68c

... forest species in exquisite colors, shaded backgrounds... ... 8784 —

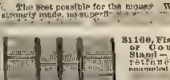


... hands of note on front, highly a...



## POST CARD DISPLAY RACKS

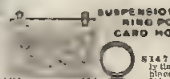
The best possible for the money. Well and strongly made, as specified.



$1166, Flat Wall or Counter Stand — Rack 21 ... retinned and nickelized finish

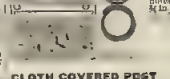
$1161, Revolving Rack—28x12, strong iron base, retinned and black nickelized finish, displays 50 styles, holds 2500 cards ... $ 96

stand 95 in., 200 separate pockets holding a total of 5000 cards. Occupies not over 4 square feet of floor space. Each packed in crate knocked down, total wt. 120 lbs. Each, $6.75



## SUSPENSION RING POST CARD HOLDER

$147—Bright ... ly tinned, double ... plated wire ... 24 in length... 1 ...

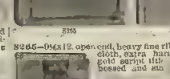


## CLOTH COVERED POST CARD ALBUMS.

These numbers are bound to give satisfaction and good wear.

$265 $266

$265—9½x12, open end, heavy fine ribbed black cloth, extra hard surface, gold and silver title ... bossed and ...



$267—8¾x11¾, attractive black cloth cover, gold and ...

$238—10¾x13½, Longfellow shape, cloth padded front and back, new pastoral and frosted effect, embossed and stamped white enamel design and title, holds 600 cards. 1 in box... ... Each, 67c

# 1910 Maxwell Model 62

The new four-cylinder, thirty H. P. models of the Maxwell line for 1910 follow in most particulars the construction of the same cars a year ago, although there are a number of important modifications and refinements which should interest the reader.

The most obvious changes are a longer wheel base, larger wheels, roomier bodies and a marked improvement in riding qualities attained by the use of three-quarter elliptic springs.

The frame is of pressed steel, hot riveted, and of channel section.

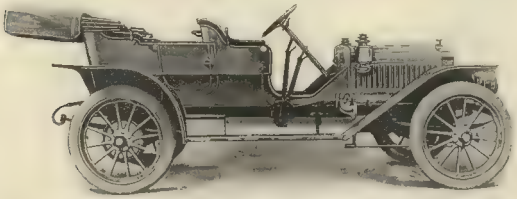


Fig 1 The 1910 Maxwell Model 62. This new car sells for $1,500, has a 4-cylinder 30 H. P. motor, three point suspension of power plant, multiple disc clutch, locking device in the change speed gear, etc., as previously used in Maxwell cars. The tonneau is detachable, converting the car into a runabout.

POWER PLANT

The power plant is of the four-cylinder vertical type, with cylinders cast separately, so that five large bearings can be used. Easy access to connecting rods, main bearings, etc., is effected by large hand holes, four on each side. The valve chambers and water jackets are integral with cylinders. The water spaces are very large and extend not only around the piston chamber but also around the valve chambers. The valves themselves are of generous size, located on opposite sides and operated by cams and square push rods moving in bronze guides.

The crank case forms a unit with the transmission case, and is a special aluminum alloy casting, divided into four compartments which hold a quantity of oil for lubricating main bearings and connecting rod bearings by splash. The crank shaft is drop forged of nickel steel, finished all over, and treated by a special toughening process. The main bearings are of specially compressed babbit metal and provided with grooves to facilitate proper lubrication. The rods were especially designed to allow adjustment at both ends and have oil grooves to insure perfect lubrication.

No change has been made in the transmission, which, as in former cars, is of the progressive sliding gear type, with three forward speeds and reverse. A noteworthy feature of all Maxwell cars is the provision of an interlocking device, consisting of a notched quadrant, which makes it absolutely impossible for the operator to shift gears while the clutch is in engagement. All gears are made of chrome nickel steel of ample proportions and accurately cut. The motor and transmission as usual in these cars are supported in the frame at three points.

The clutch is of the well known multiple disc type, running in oil as in the other models. This arrangement reduces wear to an almost negligible quantity. The oil in the clutch apartment also performs the peculiar function of facilitating the action of the clutch in engagement, for while it lubricates the clutch with the plates sliding loosely upon one another the cohesive property of the thin film of oil that remains between the plates after the surplus has been squeezed out, causes the clutch plates to be locked firmly and to rotate together without slipping when the clutch is engaged. Yet the clutch can be made to slip to any desired degree, without heating, a welcome feature when, as it often happens in crowded traffic, it is desired to slow the car down for a moment without changing gears.

The drive to the wheels is by propeller shaft with two universal joints. The forward joint is packed in grease while the one at the rear end of the shafts is provided with a unique self-oiling device. The engine is inclined so that a straight line may be drawn through the engine shaft and continued through the transmission and drive shafts through the differential. This straight line drive reduces wear in the universal joints to a minimum besides saving engine power.

Cooling is by the thermo-syphon system, of which the Maxwell was one of the earliest exponents. This method of engine cooling requires no pump. The cooling effect is proportionate to the requirements of the engine. The action of the honeycombed radiator is assisted by a belt-driven fan.

The carburetor is of Maxwell design, of the constant level, float feed type and provided with means for automatic compensation.

The problem of lubrication is most ingeniously solved by a special pump which forces the oil in exact quantities through a single sight feed into each cylinder. The lubricator is driven by a double set of gears and is positive in its action. The cylinder bears at its base a grooved ring, which is kept filled with oil at all times and into this the piston dips with each downward stroke. The piston itself is provided with two grooves.

Ignition is by magneto with non-vibrating coil, a battery of dry cells being added to facilitate easy starting. The coil is carried in a steel cylinder under the floor boards so that the dash is unencumbered with accessories and shows only the two-way switch, a single sight feed and glass gauge indicating the level of the lubricant in the tank, which latter also is carried under the hood.

Gas control is double, by pedal and by lever located at the left immediately under the steering wheel. Spark control is by a similar lever under the wheel, located on the right side.

The steering wheel is large and the steering itself is accomplished by worm and sector.

The rear axle is of substantial construction and equipped with four roller bearings, two on either side of the differential and two near the hubs. The drive pinion also is equipped with two improved roller bearings. Two sets of brakes of the external contracting and internal expanding type are mounted on the rear hubs.

The wheel base has been lengthened to 110 inches, which is well within reasonable limits, long enough for comfortable riding, at the same time short enough to permit of easy handling in street traffic. The wheels are of artillery pattern of selected second-growth hickory; their diameter is 34 inches and the rims are of the quick-detachable pattern, with four-inch tires in front and rear.

All Maxwell bodies are made of sheet steel with stamped mouldings, a construction as light as wood and stronger than aluminum, not liable to breakage, since dents may be hammered out while in the case of the broken wood body the substitution of an entire new panel becomes necessary.

The thirty H. P. Maxwell chassis is furnished with three styles of body: the Model "E" five-passenger touring car, at $1,500; the Model "G" roadster, at $1,500; and the Model "G2" touring car with detachable tonneau. An extra charge of $75 is made for the detachable tonneau. The equipment includes gas lamps and generator, oil side lights, tail lamp, horn, tools and tire kit.

## The 1910 Duryea Buggyaut

The Buggyaut is claimed to be an all-the-year around vehicle and does not have yearly changes of models. Its maker, Chas. E. Duryea, of Reading, Pa., has long been an advocate of sticking to a chosen model year after year; and his present design, being air cooled, is a good winter seller and so does not offer a slack period. Improvements are made whenever experience shows the need thereof or ability permits. An advocate and user of mechanical means for generating the electric current since 1896, he now offers the option of a magneto as the source of current at $50 above the usual price. It is claimed that most users find the Buggyaut engine cools perfectly without a fan, but to those who insist on having one whether needed or not he now offers a lighter higher speeded four bladed fan instead of the many bladed one supplied in 1909. This fan has a cast aluminum hub and pulley carrying the ball bearings and is a very light and neat device. The cooling spines have been lengthened on the cylinder heads with consequent greater cooling surface and the great rapidity with which the copper spines carry out the heat permits using longer spines than is possible with cast iron or steel. The side bars of the chassis have been spread farther apart at their rear ends with much increased room for the cross springs and of course easier mounting of the carriage body. This placing carries the load farther from the center of the rear axles and so in effect stiffens this; the closer the load is carried to the wheels the less strength the axle need have at the center.

BODIES LENGTHENED.

The single seated bodies have been slightly lengthened to give more leg room, although holding to the neat light buggy effect, and the seats have been widened slightly. The storm fronts now roll up and fasten to the top where they are always in place ready for use instead of having to be removed as heretofore.

The wearing portions of the driving rings have proven themselves quite long

lived and it is claimed even to the surprise of the maker have not required even annual renewal thus far. They are made of a special tough steel and having ample surface resist the driving pressure and the slight friction quite successfully. That they may be quickly renewed, however, the later ones are not even pinned in place but are forced so tightly into grooves in the supporting ring that when worn down to their limit they can be loosened with a hack saw and new ones sprung in without other tools or machine work; thus making a most cheap replacement of the wearing surfaces.

The valves into the crank case have been slightly enlarged with some gain in speed and maximum power to the engine The vaporizing surface available in the tubes from the carburetor to the engine has been considerably increased in area with better ability to properly use the low grade gasolines now on the market and with some gain in economy. It is often said that it is impossible to feed mixture alike to all cylinders of a two-cycle engine because the vacuum and compression in the crank cases varies the mixture due to possible leaks or variations in volume; but in the Buggyaut engine there is now provided means for easily enriching either cylinder's supply of mixture thus compensating for any variations. This permits both cylinders to be fed the proper mixture.

The Duryea Buggyaut which is shown herewith is fitted with folding seat, open and double top. This makes a very light and simple family carriage able to carry four people comfortably. The rear part of the top is quickly removable and then the rear seat can be folded leaving a neat single seated buggy for the daily use of a doctor or other business man. The forward top is fitted to a shifting rail and is therefore easily removed also if desired.

The permanent seat is set nearly in the middle of the wheel base and gives the most comfortable position for the riders. The rear seat overhangs the rear axle very slightly but being mounted on very easy springs is not uncomfortable. The mechanism is wholly at the rear, so that the riders get no odor or heat from it and the weight being on the rear wheels insures freedom from slipping of the tires, with consequent reduction of tire expense.

The "Duryea" Buggyaut

Mudguards are furnished if ordered but the narrow tires throw very little mud. The mechanism is so simple that there is little need for accessibility, but the spark plugs can be reached from either side The grease cups and timer are in plain sight from the rear and if desired the floor can be lifted exposing the whole top of the motor. There is no mechanism in front which leaves the front box available for parcels and renders the front wheels easy to push through mud or sand, a decided advantage in bad road localities.

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It has been decided to hold the Fourth Annual Kansas City (Mo.) Automobile Show from February 26th to March 5th, 1910.

# Horse Clipping Machines

## PRIEST'S HAND POWER

No. 40

No. 15

| No. | | Each |
|---|---|---|
| 40 | Balanced Arm Beltless Machine, Steel Frame, Cut Gears, a Machine of Great Power for Fast and Continuous work. Regular Equipment, No. 40 Handle, with Three in. Roller Bearing Cutters, One Extra Set 3 in. Cutters. Weight, Crated for Shipment, 100 pounds. Complete | $33.35 |
| 15 | Powerful Belt Machine with Geared Device. Regular Equipment, One No. 15 3 in. Handle, with Ball Bearing Cutters. One Extra Set Non Ball Bearing Cutters. Weight, Crated for Shipment, 100 Pounds. Complete | 26.25 |

## PRIEST'S POWER MACHINES

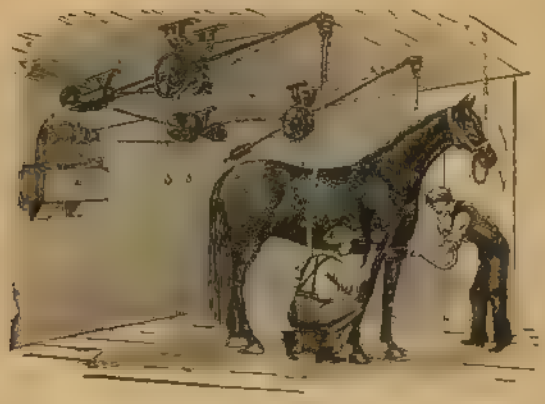
No. 7–Single

No. 8–Single

| No. | | Each |
|---|---|---|
| 7 | Single, for One Operator with Extra Set 3 in. Cutters. This Machine is not recommended for use with the Grooming Attachment, as there is no Provision for Reversing the Brush. Weight, Crated for Shipment, 175 Pounds. Complete | $98.35 |
| 8 | Single, for One Operator, Designed Especially for Use with the Grooming Attachment, which may be Reversed Instantly, without Stopping the Machine. Complete without Capping Attachment. Crated ready for Shipment. Weight 197 Pounds. Complete | 113 33 |

# Horse Clipping Machines

## PRIEST'S POWER



No. | Each
---|---
7-Double for Two Operators. Two No. 7 Machines Driven from One Counter Shaft. Complete Machine includes Counter-Shaft and all Overhead Work, and Clipping Handles. Weight, crated for Shipment, 315 Pounds. Complete | $146.65

## GROOMING ATTACHMENT

For Use on all Priest's Power Machines

Each
Complete, with 3¼ x 6 in. Brush ..... $10.00

## CLIPPING HANDLES

**For Priest Power Machine**

**No. 1–Vibrating Handle**

For All Priest's Power Machines

Each
**Handle**–Complete, 3 in ..... $20.00

**No. 1–Vibrating Cutter**

For Priest No. 1 Handles

Each
**Cutter**, Complete, 3 in ..... $ 4.00
**Top Plates**, 3 in ..... 1 35
**Bottom Plates**, 3 in ..... 2 00

# Clipping Handles

For Priest's Power Machines

**No. 10–Vibrating Handle**
For All Priest's Power Machines

| | |
|---|---|
| **Handle, Complete, 3 in** | $20.00 |

**No. 10–Vibrating Cutter**
For No. 10 Handles

| | Each |
|---|---|
| **Cutter, Complete, 3 in** | $ 4.00 |
| **Top Plates** | 1.35 |
| **Bottom Plates** | 2.00 |

**No. 15–Vibrating Handle**
For All Priest's Power Machines

| | Each |
|---|---|
| **Handle, Complete, 3 in** | $ 8.00 |

**No. 15–Vibrating Cutter**
For No. 15 Handle

| | Each |
|---|---|
| **Cutter, Complete, 3 in** | $ 4.00 |
| **Top Plates** | 1.35 |
| **Bottom Plates** | 2.00 |

**No. 40–Handle or Cutting Attachment**

| | | | |
|---|---|---|---|
| **Handle, Complete, 3 in** | $ 8.00 | **Top Plates** | $ 1.35 |
| **Extra Cutters, 3 in** | 4.00 | **Bottom Plates** | 2.00 |

## PARTS FOR SHAFTS

### For Hand Power Machines

| | Each | | |
|---|---|---|---|
| **Extra Shafts** | $ 6.65 | **Links** | Each $ 0.05 |
| **Shaft Cases** | 4.35 | **Intermediate Pieces** | Each .07 |
| **Recovering Cases** | 1.00 | **Rivets** | Doz. .07 |
| **Hooks** | .65 | **Extra Steel Balls** | Each .02 |

### For Power Machines Nos. 7 and 8

| | Each | | |
|---|---|---|---|
| **Extra Shafts** | 13.35 | **Rivet for Links** | Doz $ 0.07 |
| **Shaft Cases** | 6.65 | **Intermediate Piece** | Each .07 |
| **Quill** | 1.35 | **Rivet, for Intermediate Piece** | Doz. .07 |
| **Sleeve** | .07 | **Links, Female** | Each .07 |
| **Hook** | .35 | **Links, Male** | Each .07 |

# Clean Cut Cross Cut Saws

Special Saw Steel, Patent Ground, Fully Warranted

**No. 500–Pacific Tooth**

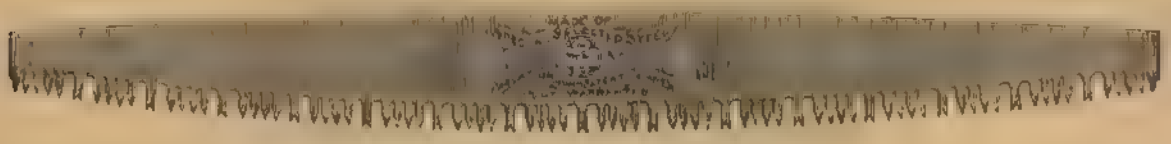
12 x 17 Gauge

| Length Feet | 6½ | 7 | 7½ | 8 |
|---|---|---|---|---|
| List Each | $6.50 | 7.00 | 7 50 | 8.00 |

**No. 510–Tuttle Tooth**

Standard Gauge

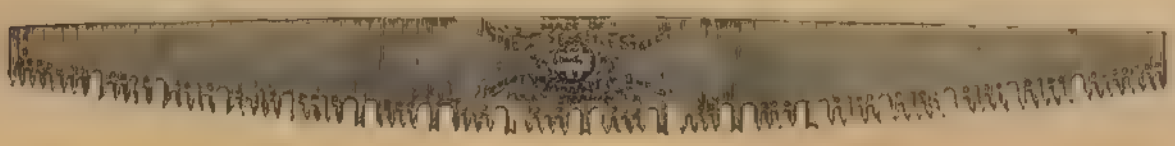
| Length Feet | 4½ | 5 | 5½ | 6 | 6½ | 7 | 8 |
|---|---|---|---|---|---|---|---|
| List Each | $2.70 | 3.00 | 3.30 | 3.60 | 3.90 | 4.20 | 4.80 |



**No. 520–Oregon Lance Tooth, Not Perforated**

14 x 18 Gauge

| Length Feet | 5 | 5 ½ | 6 | 6½ | 7 |
|---|---|---|---|---|---|
| List Each | $4 00 | 4 40 | 4.80 | 5.20 | 5.60 |



**No. 530–Oregon Lance Tooth, Perforated**

14 x 18 Gauge

| Length Feet | 4½ | 5 | 5½ | 6 | 6½ | 7 | 8 |
|---|---|---|---|---|---|---|---|
| List Each | $3.60 | 4.00 | 4.40 | 4.80 | 5.20 | 5.60 | 6.40 |

# Cross Cut Saws

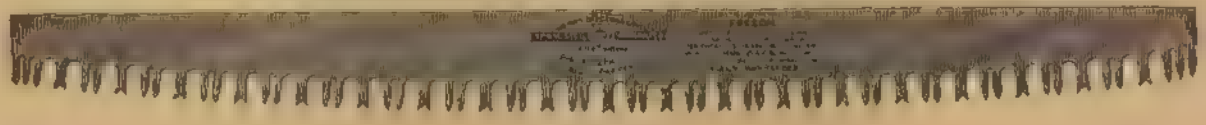
## HENRY DISSTON & SONS

### COUGAR

Fast Cutting—Easy Running

Ground even thickness on tooth edge and thin on back, giving maximum amount of clearance, without sacrificing elasticity and stiffness.

| Length Feet | 6 | 6½ | 7 | 7½ | 8 |
|---|---|---|---|---|---|
| Each | $ 6.80 | 7.80 | 9.00 | 10 00 | 11.40 |



### FALCON

Humboldt Pattern

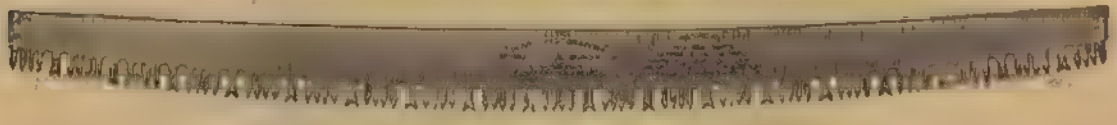
Ground five gauges thinner on back than on tooth edge

| Length Feet | 6 | 6½ | 7 | 7½ | 8 | 8½ | 9 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|---|
| Each | $ 6.80 | 7 80 | 9.00 | 10.00 | 11.40 | 13.92 | 14.75 | 18.52 | 27.36 |

All saws are wrapped in paper—teeth protected by a wooden strip

# Cross Cut Saws

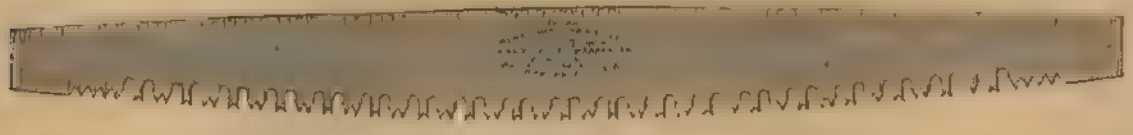
## HENRY DISSTON & SONS



### Nevada Pattern Falling

12 x 17 Gauge. Width at Center 8 ½ inches

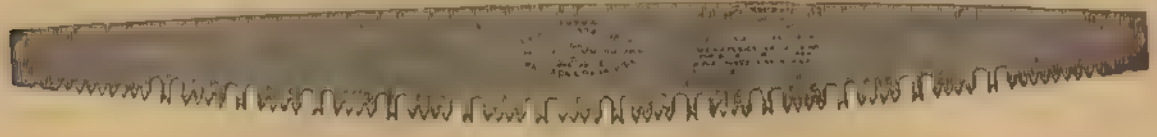
| Length Feet | 8 | 9 | 10 |
|---|---|---|---|
| Each | $ 8.80 | 10.12 | 11.44 |



### Tuttle Tooth

Standard Gauge

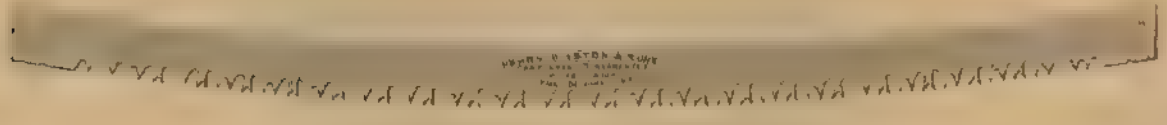
| Length Feet | 5 | 5½ | 6 | 6½ | 7 | 7½ | 8 |
|---|---|---|---|---|---|---|---|
| Each | $ 3.00 | 3.30 | 3.60 | 3.90 | 4.20 | 4.50 | 4.80 |



### Perforated Lance Tooth

14 x 18 Gauge

| Length Feet | 5 | 5½ | 6 | 6½ | 7 |
|---|---|---|---|---|---|
| Each | $ 4.00 | 4.40 | 4.80 | 5.20 | 5.60 |



### Narrow Hollow Back, Champion Tooth

| Length Feet | 5 | 5½ | 6 |
|---|---|---|---|
| Each | $ 1.80 | 1.98 | 2.16 |

### Tenon Tooth

| Length Feet | 4 | 4½ | 5 | 5½ | 6 |
|---|---|---|---|---|---|
| Each | $ 2.40 | 2.70 | 3.00 | 3.30 | 3.60 |

Clean Cut

# One Man Saws

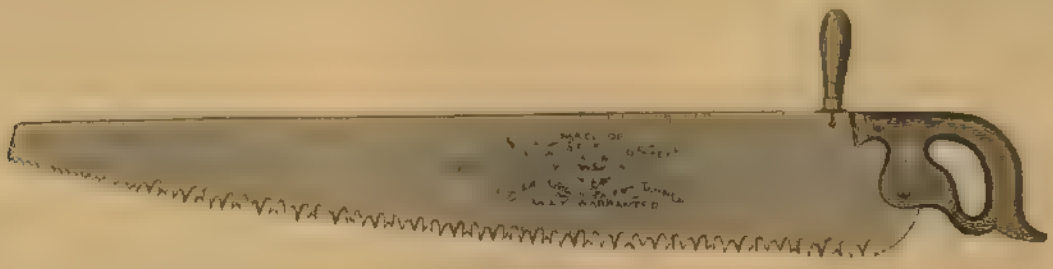
**All "Clean Cut" One Man Saws are Fully Warranted**

**Sierra Tooth**

| Length, Feet | 3 | 3½ | 4 | 4½ | 5 |
|---|---|---|---|---|---|
| Clean Cut–Each | $ 2.75 | 3 25 | 3.75 | 4.25 | 4 75 |

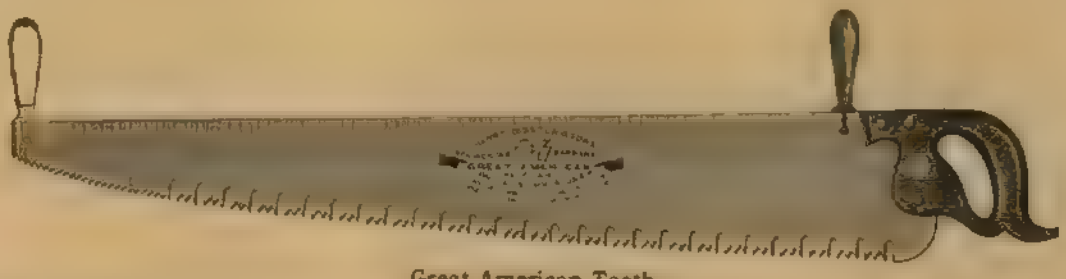
**Perforated Lance Tooth**

| Length, Feet | 3 | 3½ | 4 | 4½ | 5 |
|---|---|---|---|---|---|
| Clean Cut–Each | $ 2.65 | 3.10 | 3.50 | 4.00 | 4.45 |
| Disston –Each | 2.65 | 3.10 | 3.50 | 4.00 | 4.45 |



**Champion Tooth**

| Length, Feet | 3 | 3½ | 4 | 4½ | 5 |
|---|---|---|---|---|---|
| Clean Cut–Each | $ 2 25 | 2.60 | 3.00 | 3.35 | 3.70 |
| Disston –Each | 2.25 | 2.60 | 3.00 | 3.35 | 3.70 |



**Great American Tooth**

| Length, Feet | 3 | 3½ | 4 | 4½ | 5 |
|---|---|---|---|---|---|
| Disston–Each | $ 2.55 | 2 85 | 3.25 | 3.65 | 4.10 |

All Above Three in a Package

# Cutter's Specialties

**Cutter's Center Hood**

| Style | Each |
|---|---|
| With Spreader Tip Arm, Edison Base Socket | $ 3 50 |

**Cutter's Looped Hood**

| Style | Each |
|---|---|
| Enam. Cross Arm, Edison Base Socket, 1 light | $ 3 00 |
| Enam. Cross Arm, Edison Base Socket, 3 lights | 4 25 |
| Enam. Cross Arm, Edison Base Socket, 5 lights | 5 50 |

**Standard Street Hood**

Shipped complete with curved Poleplate, 3 foot iron Gooseneck, Enameled Arm, Waterproof Hood, Hinged Reflector and Socket.

| Without Brace Arm for Back of Pole | Each |
|---|---|
| 1-Light complete, Edison Base Socket | $ 3 92 |
| 3-Light complete, Edison Base Socket | 5 18 |
| 4-Light complete, Edison Base Socket | 5 80 |
| 5-Light complete, Edison Base Socket | 6 42 |

| With Brace Arm for Back of Pole | Each |
|---|---|
| 1-Light complete, Edison Base Socket | $ 4 62 |
| 3-Light complete, Edison Base Socket | 5 87 |
| 4-Light complete, Edison Base Socket | 6 50 |
| 5-Light complete, Edison Base Socket | 7 13 |

**Inner Wired Hood**

Complete with Poleplate, 3 foot iron Gooseneck, Waterproof Hood, Reflector and Socket.

| | Each |
|---|---|
| 1-Light complete, Edison Base Socket | $ 3 62 |
| For Brace Arm for Back of Pole, add | 70 |

**Urban Street Hood**

Complete with Poleplate, 3 foot iron Gooseneck, Spreader, Hood and Reflector and Socket.

| | Each |
|---|---|
| 1-Light complete, Edison Base Socket | $ 4 00 |
| For Brace Arm for Back of Pole, add | 70 |

**Wall Hood**

Has Pipe extending 1 foot inside of flange, making Gooseneck 4 feet long, Hood and Reflector and Socket.

| | Each |
|---|---|
| 1-Light complete, Edison Base Socket | $ 3 87 |

**12-inch Bracket Hood**

Same as Standard Street Hood, but has smaller metal parts and shorter Cross Arm. Shipped with Plate, 3 foot Gooseneck, Hood and Reflector and Socket.

| | Each |
|---|---|
| 1-Light complete, Edison Base Socket | $ 5 62 |

# Cutter's Specialties

**Entrance Hood**

An ornamental fixture with pipe extending 3 feet outside of flange and one foot inside of same.

Each

Complete with Hood and Edison Base Socket . . $ 5 87

**Opera Hood**

Ornamental Bracket Hood with grooved Wall Plate and 5 foot Gooseneck.

Each

Complete with Hood and Edison Base Socket . . $ 6 25

**Cutter's "Western" Street Hood**

An inner wired hood with ornamental Pole plate.

Each

Complete with Hood and Edison Base Socket . . $ 4 00

**Cutter's "Spartan" Street Hood**

An inner wired hood with grooved Wall Plate.

Each

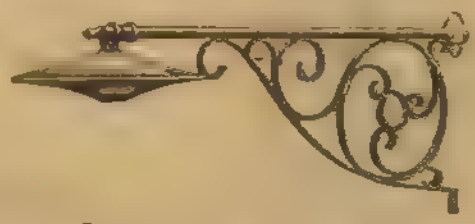
Complete with Hood and Edison Base Socket . . $ 6 62

**Cutter's "Corinthian" Street Hood**

An inner wired hood with heavy ornamental cast iron Wall Plate.

Each

Complete with Hood and Edison Base Socket . . $ 6 62



**Cutter's "Delphian" Street Hood**

An inner wired hood with grooved Wall Plate.

Each

Complete with Hood and Edison Base Socket . . $ 6 62

**Cutter's "Athenian" Street Hood**

An inner wired Hood, with grooved Wall Plate Complete with Hood and Edison Base Socket

Each

$ 6 62

# Cutter's Tungsten Street Hoods

**Cast Scroll Telescope Bracket**

Complete with 22 in. Tungsten Reflector and thin socket.

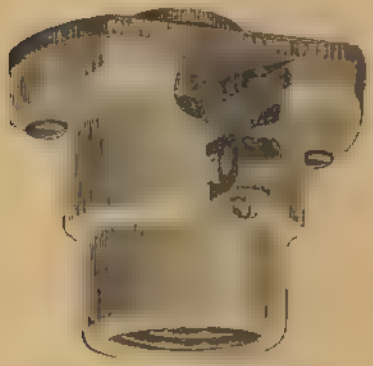
| | Each |
|---|---|
| One light, Edison Base | $11 25 |

**Boulevard Telescope Bracket**

Complete with 22 in. Tungsten Reflector and thin socket.

| | Each |
|---|---|
| One light, Edison Base | $11 75 |

## CUTTER'S STREET HOOD SOCKETS



**Regular Street Hood Sockets**

| | Each |
|---|---|
| For use with Cutter Street Hoods | $ 0 63 |

**Spring Suspended Street Hood Sockets**

| | Each |
|---|---|
| For Tungsten Lamps | $ 1 25 |

## CUTTER'S MANY LIGHT HOODS

Three Light

Four Light

Any of Cutter's Street Hoods except the 12 in. may be furnished with Many Light Hoods for 2, 3, 4 or 5 lights at $0 62 per light over the list price for 1 light

As regularly furnished the lamps slant a little but they can all be furnished with lamps plumb when so ordered.

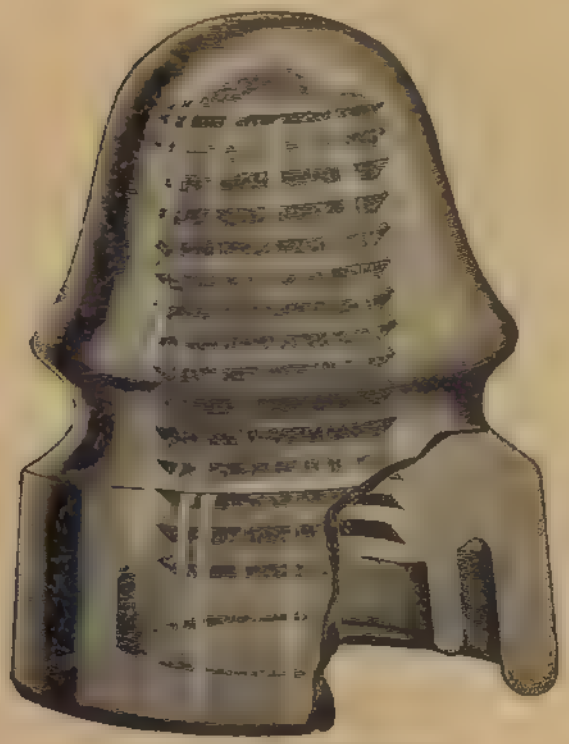
# Glass Insulators

No. 9—Pony

| Groove, inch | Weight, Each | Number in Barrel | Per 1000 |
|---|---|---|---|
| ⅜ | 9 oz. | 400 | $37 00 |

No. 11—Pony

| Groove, inch | Weight, Each | Number in Barrel | Per 1000 |
|---|---|---|---|
| ⅜ | 9 oz. | 375 | $37 00 |



Deep Groove Double Petticoat

| Groove, inch | Weight, Each | Number in Barrel | Per 1000 |
|---|---|---|---|
| ½ | 1⅝ lbs. | 175 | $70 00 |

Extra Deep Groove Double Petticoat

| Groove, inch | Weight, Each | Number in Barrel | Per 1000 |
|---|---|---|---|
| ⅞ | 1¼ lbs | 175 | $80 00 |

# Glass Insulators

Two Piece Transposition

| Diam. inch | Height, inch | Weight, Each | Number in Barrel | Per 1000 |
|---|---|---|---|---|
| 3¾ | 4½ | 1⅞ lbs. | 125 | $180 00 |

Large Transposition

| Diam. inch | Height, inch | Weight, Each | Number in Barrel | Per 1000 |
|---|---|---|---|---|
| 3¾ | 4½ | 2 lbs. | 100 | $195 00 |

Deep Groove

| Groove, inch | Weight, Each | Number in Barrel | Per 1000 |
|---|---|---|---|
| ⅛ | 1⅜ lbs. | 200 | $82 50 |

No. 3—Knowles Cable

| Diam. inch | Height, inch | Top Groove | Side Groove | Weight, Each | Number in Barrel | Per 1000 |
|---|---|---|---|---|---|---|
| 4 | 5½ | 2 in. | 1½ in. | 2¾ lbs. | 90 | $160 00 |

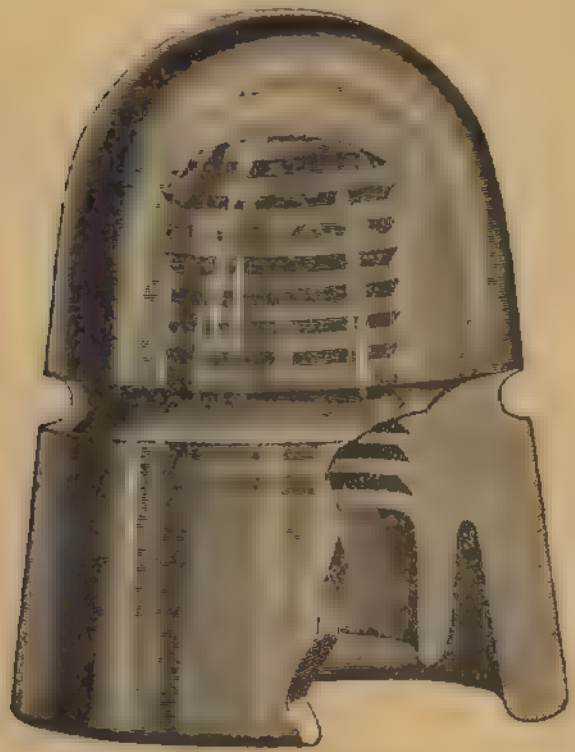
# Glass Insulators

**Pony Double Petticoat**

| Groove, inch | Weight, Each | Number in Barrel | Per 1000 |
|---|---|---|---|
| ⅜ | ¾ lb. | 300 | $50 00 |

**No. 2—Knowles Cable**

| Diam. inch | Height, inch | Top Groove | Side Groove | Weight, Each | Number in Barrel | Per 1000 |
|---|---|---|---|---|---|---|
| 3½ | 4½ | 1⅛ in. | 1 in. | 2 lb. | 140 | $100 00 |



**W. U. Double Petticoat**

| Groove inch | Weight Each | Number in Barrel | Per 1000 |
|---|---|---|---|
| ⅜ | 1½ lb. | 165 | $80 00 |

**No. 1—Cable**

| Diam. inch | Height inch | Top Groove | Side Groove | Weight Each | Number in Barrel | Per 1000 |
|---|---|---|---|---|---|---|
| 3⅛ | 3½ | ⅛ in. | ⅝ in. | 1⅛ lb. | 170 | $90 00 |

# Pocket Compasses

**No. 1700**

Brass Case, Open Face, Silvered Metal Dial, with Needle Stop

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 45 | 1¾ | $ 9.00 |

**No. 1770**

Brass Case, Open Face, Card Dial

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 30 | 1⅜ | $ 3.00 |
| 40 | 1½ | 4.00 |
| 50 | 2 | 5.00 |

Nos. 1773 and 1774

**No. 1773**

Nickel Plated, Open Case, Card Dial

| Size M-M | Size in. | Per Doz |
|---|---|---|
| 45 | 1¾ | $ 6.00 |

**No. 1774**

Nickel Plated Open Case, Metal Dial

| Size M-M | Size in. | Per Doz |
|---|---|---|
| 45 | 1¾ | $ 7.00 |

**No. 1702**

Brass Case, Open Face, Silvered Metal Dial, Jeweled Needle, Full Divisions.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 45 | 1¾ | $15 00 |

**No. 1706**

Brass Case with Hinged Cover, Silvered Metal Dial, with Needle Stop.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 45 | 1¾ | $16.00 |

Nos. 1776 and 1777

**No. 1776**

Nickel Plated Hunting Case, Spring Cover, Metal Dial.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 45 | 1¾ | $13.00 |

**No. 1777**

Nickel Plated Hunting Case, Spring Cover, Metal Dial, Jeweled Needle.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 45 | 1¾ | $18 00 |

# Pocket Compasses

No 1705-1715

No.
**1705**–Brass Case, Slip Cover, Silvered Metal Dial, Jeweled Needle, Full Divisions with Stop Needle.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 45 | 1¾ | $18.00 |

No.
**1715**–Nickel Case, Slip Cover, Silvered Metal Dial, Jeweled Needle, Full Divisions, with Stop Needle.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 45 | 1¾ | $24.00 |

No. 1720-1721-1727

No.
**1720**–Brass Case, Slip Cover, Silvered Metal Dial, Jeweled Needle with Automatic Stop, Full Divisions, Raised Circle of Degrees 0 to 360

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 50 | 2 | $21.00 |

No
**1721**–Brass Case, Slip Cover, Silvered Metal Dial, Jeweled Bar Needle with Automatic Stop, Full Divisions, Raised Circle of Degrees 0 to 360,

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 50 | 2 | $27.00 |
| 60 | 2½ | 30.00 |

No 1728

No.
**1728**–Brass Case, Slip Cover, Black Metal Dial with Raised Silvered Circle of Degrees 0 to 360, Jeweled Bar Needle, Automatic Stop.

| Size M-M | Size in | Per Doz. |
|---|---|---|
| 50 | 2 | $30 00 |

No.
**1727**–Nickel Case, Slip Cover, Silvered Metal Dial, Jeweled Bar Needle, Full Divisions, Automatic Stop.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 50 | 2 | $36.00 |
| 60 | 2½ | 39.00 |

No 1708

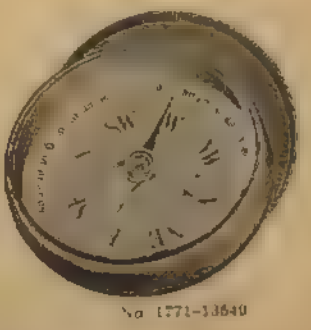
No.
**1708**–Brass Case, Hinged Cover, Silvered Metal Dial, Full Divisions, Jeweled Needle with Stop.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 45 | 1¾ | $21.00 |

No. 1703

No.
**1703**–Brass Case, Slip Cover, Silvered Metal Dial, Plain Divisions, Stop Needle.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 45 | 1¾ | $12 00 |



No 1771-13649

No.
**1771**–Brass Case, Slip Cover, Card Dial, Close Divisions.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 30 | 1⅛ | $ 3.50 |
| 40 | 1⅜ | 4.50 |
| 50 | 2 | 6.00 |

No.
**13649**–Nickel Case, Slip Cover, Card Dial.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 30 | 1⅛ | $ 5 00 |
| 45 | 1¾ | 7 00 |

# Compasses

## BOX

No. 1750

Wood Box Compass with Hinged Cover, Paper Dial with Full Divisions

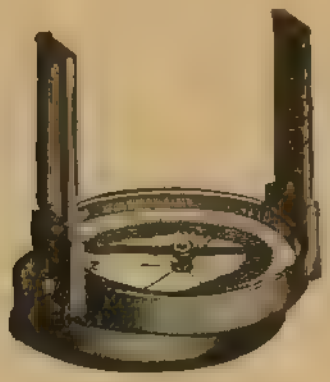
| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 70 | 2¾ | $12.00 |

No. 1754

Wood Box Compass with Hinged Cover, Metal Dial, Full Divisions, Jeweled Needle with Stop.

| Size M-M | Size in. | Per Doz. |
|---|---|---|
| 70 | 2¾ | $21.00 |

## SURVEYORS'



No. 1780

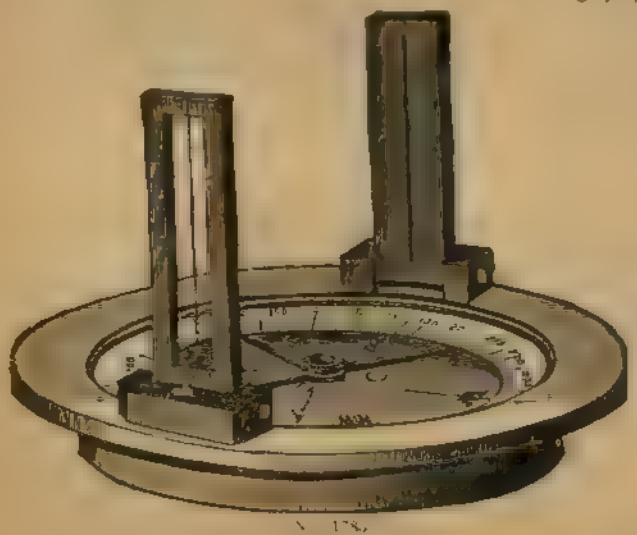
Brass Case, Pocket Size with Slip Cover, Folding Sights, Jeweled Needle with Stop. Raised Circle of Degrees 0 to 360

| Size M-M | Size in. | Each |
|---|---|---|
| 60 | 2¼ | $ 7.50 |

No. 1790

Nickel Case, Hinged Cover with Folding Sights, Jeweled Bar Needle with Stop, Silvered Metal Dial with Raised Circle of Degrees 0 to 360.

| Size M-M | Size in. | Each |
|---|---|---|
| 50 | 2 | $ 9.50 |



No. 1783

Brass Case with Folding Hook Sights, Silvered Raised Dial, Jeweled Bar Needle, in Leather Velvet Lined Case.

| Size M-M | Size in. | Each |
|---|---|---|
| 70 | 2¾ | $ 8.50 |

# New Royal Incandescent Lamps

EDISON BASE

45 to 130 Volts

Class "B"

200 to 250 Volts

| Candle Power | Standard Life Hours | 45 to 130 Volts | | 200 to 250 Volts | | | |
|---|---|---|---|---|---|---|---|
| | | Clear, each | Frosted, each | Clear, each | Frosted, each | Clear, each | Frosted, each |
| 2 | 200 | $0 44 | $0 49 | $0 40 | $0 45 | $0 44 | $0 49 |
| 4 | 200 | 44 | 49 | 40 | 45 | 44 | 49 |
| 8 | 200 | 44 | 49 | 40 | 45 | 44 | 49 |
| 16 | 200 | 44 | 49 | 40 | 45 | 44 | 49 |
| 32 | 100 | 80 | 86 | 60 | 66 | 80 | 86 |

In ordering Lamps, always specify the exact Voltage wanted.

## Extra Charges for Special Bases

| | Add to Net Price Each | | Add to Net Price Each |
|---|---|---|---|
| Westinghouse Combination Base | $0 06 | T-H Base | $0 06 |

## Natural Colored Lamps

Only made in Class A; for Prices, see Page 1187.

## Superficial Coloring

All Colors (Dipped in Coloring Fluid)—Add 25% to list of Plain Lamps.

# Mazda and Tantalum Lamps

Large "C" Lamp, Regular
1¼ Watts per C. P.

"Tantalum" Lamp, Regular
2 Watts per C. P.

## MAZDA LAMPS

### 100 to 125 Volts

| Watts | C. P. | Style | Std. Pkge. | Clear | Frosted |
|---|---|---|---|---|---|
| 25 | 20 | Regular Bulb | 100 | $ 1 30 | $ 1 40 |
| 40 | 32 | Regular Bulb | 100 | 1 40 | 1 50 |
| 40 | 32 | Large Bulb | 50 | 1 80 | 1 90 |
| 60 | 48 | Large Bulb | 50 | 2 00 | 2 14 |
| 100 | 80 | Large Bulb | 24 | 2 70 | 2 90 |
| 150 | 120 | Large Bulb | 24 | 4 00 | 4 30 |
| 250 | 200 | Large Bulb | 12 | 5 50 | 5 90 |

### 200 to 250 Volts

| Watts | C. P. | Style | Std. Pkge. | Clear | Frosted |
|---|---|---|---|---|---|
| 15 | 30 | Large Bulb | 50 | $ 2 70 | $ 2 80 |
| 70 | 45 | Large Bulb | 50 | 3 00 | 3 20 |
| 100 | 70 | Large Bulb | 24 | 4 00 | 4 30 |
| 150 | 100 | Large Bulb | 24 | 5 80 | 6 20 |
| 250 | 170 | Large Bulb | 12 | 8 00 | 8 50 |

## TANTALUM LAMPS

### 100 to 125 Volts

| Watts | C. P. | Style | Std. Pkge. | Clear | Frosted |
|---|---|---|---|---|---|
| 25 | 12½ | Regular Bulb | 100 | $ 1 00 | $ 1 05 |
| 40 | 20 | Large Bulb | 100 | 1 00 | 1 05 |
| 50 | 25 | Large Bulb | 100 | 1 00 | 1 05 |
| 80 | 40 | Large Bulb | 50 | 1 70 | 1 76 |

### 200 to 250 Volts

| Watts | C. P. | Style | Std. Pkge. | Clear | Frosted |
|---|---|---|---|---|---|
| 50 | 25 | Large Bulb | 50 | $ 2 00 | $ 2 10 |
| 80 | 40 | Large Bulb | 24 | 2 50 | 2 60 |

**Standard Packages**—It is allowable to combine in one Standard Package all sizes of one Class of Lamps, having the same Standard Package Quantity (except that Meridian Type cannot be combined with regular type). Also different voltages and clear and frosted bulbs may be assorted.

# Mazda and Tantalum Lamps

## MERIDIAN TYPE

Tantalum Lamp

### MAZDA "MERIDIAN" LAMPS

| 100 to 125 Volts | | | | | 200 to 250 Volts | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Watts | C. P. | Diam., in. | Stan. Pack. | Frosted Bowl | Watts | C. P. | Diam., in. | Stan. Pack. | Frosted Bowl |
| 40 | 32 | 3¾ | 24 | $2.50 | 45 | 32 | 4¼ | 24 | $3.90 |
| 60 | 48 | 5 | 24 | 3.00 | 70 | 48 | 5 | 24 | 4.50 |

### TANTALUM "MERIDIAN" LAMPS

| 100 to 125 Volts | | | | | 200 to 250 Volts | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Watts | C. P. | Diam., in. | Stan. Pack. | Frosted Bowl | Watts | C. P. | Diam., in. | Stan. Pack. | Frosted Bowl |
| 40 | 20 | 3¼ | 24 | $1.50 | 50 | 25 | 3¾ | 24 | $2.80 |
| 80 | 40 | 5 | 24 | 2.00 | 80 | 40 | 5 | 24 | 3.50 |

### HOLOPHANE REFLECTORS FOR MERIDIAN TYPE LAMPS

Type "M"

# Smith & Wesson Revolvers

## NEW MODEL 1911 HEAVY FRAME TARGET

[illegible] Swing-out Cylinder Target Revolver Caliber .22 Long Rifle Cartridges S. & W. Model 23 Cartridges Pull [illegible] for .22 cal. S. & W. Model 23 Steel Cylinder Vernier Sights Checkered Walnut Combination Target Stocks S. & W. Gold Medallion

.22 Long Rifle, Blue finish, 6 inch barrel ..... $20.00

# Smith & Wesson Revolvers

## DOUBLE ACTION HAMMER

### Model 1902, Military and Police

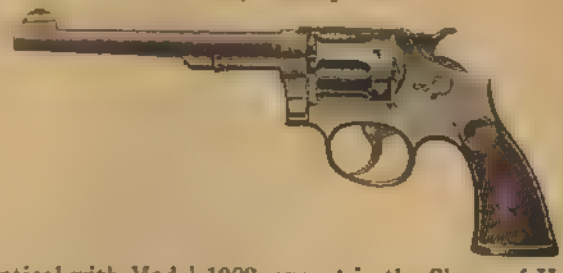
Six Shots Swing Out Cylinder Simultaneous Ejection, Rubber Stocks, Shoots .38 S. & W. Special .38 Long Colt and .32 W. C. F. Cartridges

**Nickel or Blue**

| Calibers | Length Barrel, in. | Each |
|---|---|---|
| .38 | 4–6 | 17.00 |

**Target Sights** Fitted to 6 in. barrels only Extra 2 50

### Model 1905, Military and Police



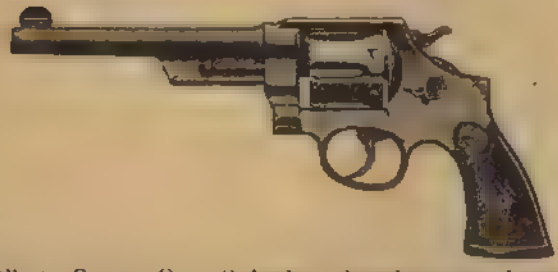
Identical with Model 1902, except in the Shape of Handle, Model 1905 having Improved Square Butt, Checked Wood Stock

**Nickel or Blue**

| Calibers | Length Barrel, in. | Each |
|---|---|---|
| .32 | 4–6 | $18.00 |
| .38 | 4–6 | 18.00 |

**Target Sights** Fitted to 6 in. barrels only Extra 2 50

### Model 1908, Military and Police



Six Shot Swing Out Cylinder Simultaneous Ejection, Checked Wood Square Butt Shoots Either 44 S. & W. Special, or .44 S. & W. Russian Cartridges

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| 44 | 6½ | $22 00 |

**Target Sights** fitted to above, extra 2.50

**Blue Finish Only**

### Target Model

Smith & Wesson Single Shot Target Pistol, Shoots .22 Long Rifle Cartridges with Adjustable Target Sights

**Nickel or Blue**

| Calibre. | Length Barrel, in. | Each |
|---|---|---|
| .22 | 6-8-10 | $16.00 |

**Factory Only**

## .38 DOUBLE ACTION PERFECTED

Nickle or Blue

Double Action Hammer, Five Shots, Automatic Shell Extractor. It is similar to the regular Double Action Model, with double locking device. Frame, Guard and Front Sight are all one piece and all flat springs are replaced with those of the spiral type. Shoots the .38 S. & W. Cartridge

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .38 | 3¼, 4, 6 | $16 00 |

**4 and 6 inch from Factory Only**

# Iver Johnson Revolvers

SAFETY HAMMERLESS Automatic Ejector, Hinged Frame AUTOMATIC HAMMER

| Calibers | Length Barrel, in. | Finish | Each |
|---|---|---|---|
| .32 and .38 Cycle | 2 | Nickel | $ 7.00 |
| .32 and .38 Cycle | 2 | Blue | 7 50 |
| .32 and .38 | 3 & 3¼ | Nickel | 7.00 |
| .32 and .38 | 3 & 3¼ | Blue | 7 50 |
| .32 and .38 | 4 | Nickel | 8 00 |
| .32 and .38 | 4 | Blue | 8 50 |
| .32 and .38 | 5 | Nickel | 9 00 |
| .32 and .38 | 5 | Blue | 9 50 |
| .32 and .38 | 6 | Nickel | 10 00 |
| .32 and .38 | 6 | Blue | 10 50 |

| Calibers | Length Barrel, in. | Finish | Each |
|---|---|---|---|
| .32 Cycle | 2 | Nickel | $ 6 00 |
| .32 Cycle | 2 | Blue | 6 50 |
| .22, .32 and .38 | 3 & 3¼ | Nickel | 6 00 |
| .22, .32 and .38 | 3 & 3¼ | Blue | 6 50 |
| .22, .32 and .38 | 4 | Nickel | 7.00 |
| .22, .32 and .38 | 4 | Blue | 7 50 |
| .22, .32 and .38 | 5 | Nickel | 8 00 |
| .22, .32 and .38 | 5 | Blue | 8.50 |
| .22, .32 and .38 | 6 | Nickel | 9.00 |
| .22, .32 and .38 | 6 | Blue | 9.50 |

Extras, See Page 1831

Automatic Hammer

AUTOMATIC AND HAMMERLESS

With Perfect Grip

.32 and .38 Calibers, All Lengths

Add to Price of above Revolvers, with Regular Grip.... $ 1.50

# Derringers

COLTS

Single

| Caliber | Length | Finish | Each |
|---|---|---|---|
| .41 R. F. | 2½ in. | Nickel | $ 6 00 |
| .41 R. F. | 2½ in. | Blue | 6 00 |

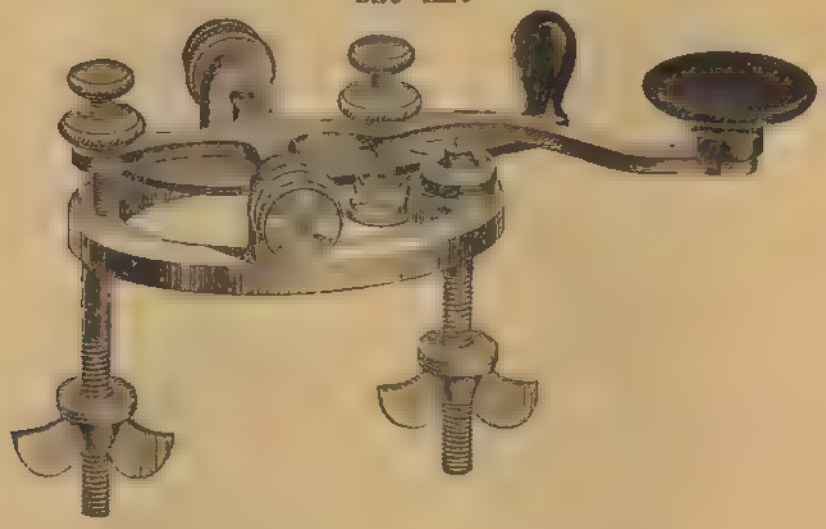
REMINGTON

Double

| Caliber | Length | Finish | Each |
|---|---|---|---|
| .41 R. F. | 3 in. | Nickel | $ 6 25 |
| .41 R. F. | 3 in. | Blue | 6.25 |

# Telegraph Instruments

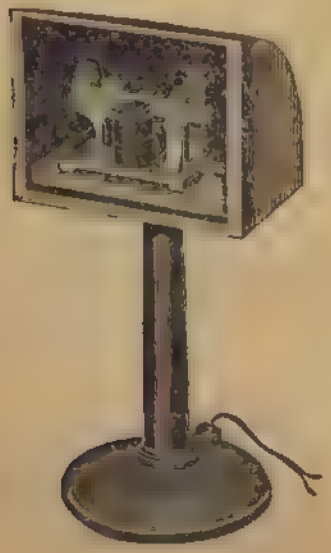
LEG KEY



| No. | | Each |
|---|---|---|
| 103 | —Nickel Plated Lever, Brass Frame, with Legs | $2 25 |

LEGLESS KEY

| No. | | Each |
|---|---|---|
| 108 | —Nicke. Plated Lever, Brass Frame, Legless | $2 75 |



PORTABLE RESONATOR

The Base of Standard is broad and heavy. Conducting Cords pass through the Base and Hollow Standard.

| No. | | Each |
|---|---|---|
| 654 | —Complete with sounder and six feet of cord | $5 00 |
| 655 | —Resonator and Base only | 3 00 |

# Binding Posts

No. 4828

No. 4827

| No. | | Each |
|---|---|---|
| 4828 | —Nickel Plated | $0 14 |
| 4827 | —Nickel Plated | 14 |

No. 4821

No 4830

| No. | | Each |
|---|---|---|
| 4821 | —Nickel Plated | $0 28 |
| 4830 | —Nickel Plated | 24 |

No. 4824

No 4820

| No. | | Each |
|---|---|---|
| 4824 | —Nickel Plated | $0 24 |
| 4820 | —Nickel Plated | 32 |

No. 4823

| No | | Each |
|---|---|---|
| 4823 | —Nickel Plated | $0 36 |

## BINDING POSTS

No. 4834

No. 4869

| No. | | Each |
|---|---|---|
| 4834 | —Nickel Plated | $0 40 |
| 4869 | —Nickel Plated | 30 |

## SEPARABLE CORD TIP

No. 2360

| No. | | Each |
|---|---|---|
| 2360 | —Separable Cord Tips, Nickel Plated | $0 08 |

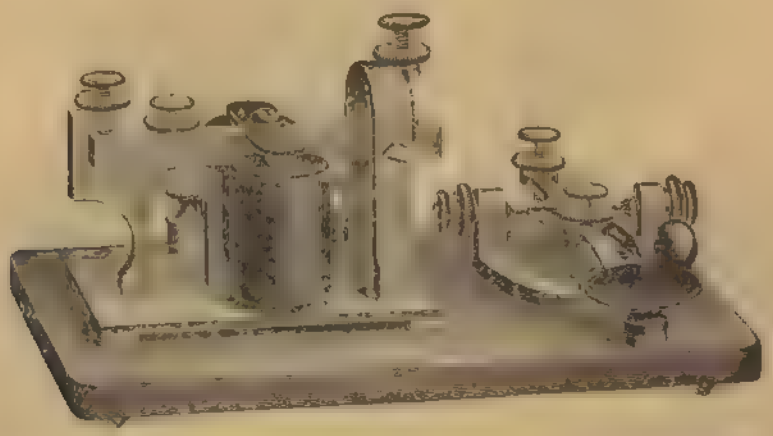
# Telegraph Instruments

## EUREKA LEARNER'S INSTRUMENT

The Eureka Telegraph Instrument is a first class standard size telegraph set. All the working parts which includes key lever, sounder lever, sounder yoke or armature, adjusting screws, etc., are finely finished composition metal, such as used in all high grade instruments. The sounder and key bases are japanned and striped with gilt.

| No. | | Each |
|---|---|---|
| 178 | Eureka Telegraph Instrument, 5 Ohms | $3 00 |
| 179 | Eureka Telegraph Instrument, 20 Ohms | 3 30 |

## IMPROVED COMBINATION SET

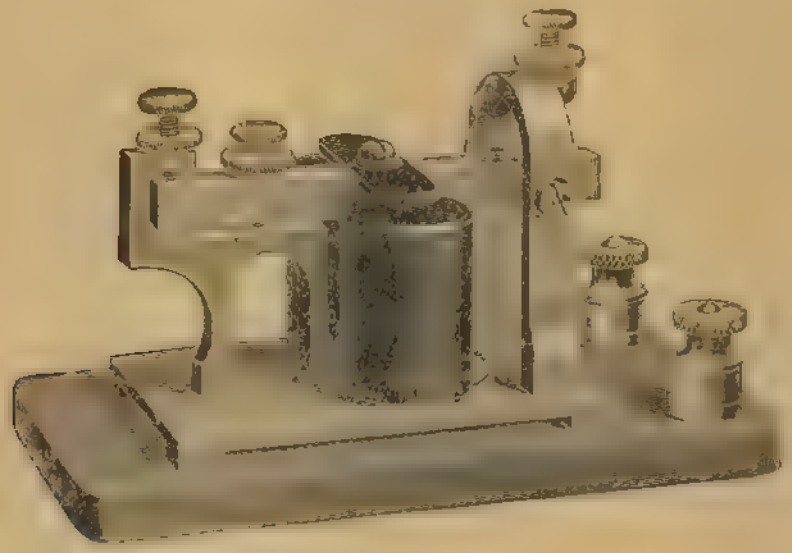


The set includes the Standard Improved Giant Sounder finely finished with rubber covered coils, mounted on polished mahogany base, with regular steel lever sound Tramm on key. All highly polished and lacquered.

| No. | | Each |
|---|---|---|
| 182 | Wound 5 Ohms—Aluminum Lever | $6 00 |
| 183 | Wound 20 Ohms—Aluminum Lever | 6 40 |

# Telegraph Instruments

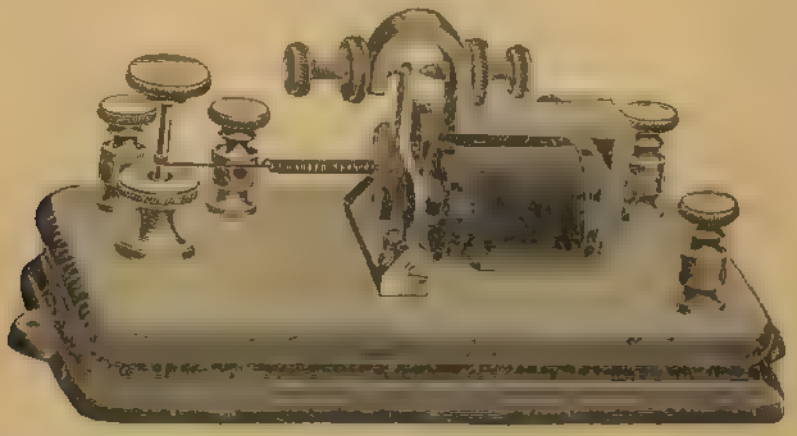
## IMPROVED GIANT SOUNDER



One Cell of ordinary Crowfoot Battery will operate this instrument producing a sound louder and clearer than can be obtained from any other sounder with two cells of battery.

| No. | | Each |
|---|---|---|
| 111 | Giant Sounder, 5 Ohms, Aluminum Lever | $3 60 |
| 113 | Giant Sounder, 20 Ohms, Aluminum Lever | 4 00 |

## STANDARD PONY RELAY



This is a strictly finished and excellent relay. Its use will enable work on lines of one to twenty miles in length, to be done with perfect ease where main line sounders fail to give satisfaction. It also requires much less battery power to operate it than does the main line sounder of a similar resistance.

| No. | | Each |
|---|---|---|
| 114 | Standard Pony Relay, 5 Ohms, for Burglar Alarm Work | $3 25 |
| 115 | Standard Pony Relay, 20 Ohms, for lines up to 10 miles | 3 75 |
| 116 | Standard Pony Relay, 50 Ohms, for lines 10 to 30 miles | 4 25 |
| 118 | Standard Pony Relay, 75 Ohms, for lines 30 to 50 miles | 4 75 |

# Tennis Goods

| | Each |
|---|---|
| **Ward & Wright**—Special selected ash, best imported gut [illegible] stringing, A with double center stringing, B with regular stringing. Weights, 13 to 15 ounces | $8 00 |
| **Davis Cup**—Special selected ash, best imported gut | 8 00 |
| **Sutton Star**—Long narrow head, 5¼ in. handle. Weights, 14 to 15 ounces | 8 00 |
| **Pim**—Special [illegible] frame, [illegible] strong [illegible] and flat throat. Weights 13 to 15 ounces | 8 00 |
| At above in water-proof cases | |
| **Campbell**—English shape, depressed throat, double center stringing. Weights, 12½ to 15 ounces | 5 00 |
| **Sears**—Selected ash frame, Doherty style stringing. Weights, 12½ to 15 ounces | 5 00 |
| **St. George**—English model. Double center stringing | 4 00 |

| | Each |
|---|---|
| **Champion**—Ward & Wright shape. Double center stringing, Oriental gut. Weights, 12½ to 15 ounces | $4.00 |
| **Columbia**—Ward & Wright shape. Double center stringing, Oriental gut. Weights, 12½ to 15 ounces | 3.00 |
| **Longwood**—Light model. Double center stringing. Weights 12½ to 15 ounces | 3.50 |
| **Park**—Full size. Frame white ash, good quality white gut. Weights, 12½ to 15 ounces | 2 50 |
| **Country Club**—Oval shape with extra center strings, Oriental gut. Weights, 12½ to 15 ounces | 2.50 |
| **Hub**—New shape. Made [illegible] piece tone gut. Weights, 13½ to 14 ounces | 2.00 |
| **Lenox**—[illegible] Handle [illegible] than regular. Light weights | 2.00 |
| **Surprise**—New model, stringing of good quality gut. Light and well balanced | 1.50 |

# Wright & Ditson Tennis Goods

## TENNIS BALLS

| | Per Doz |
|---|---|
| **Championship**—Official tournament ball | $ 5 50 |
| **Club**—Made of fine quality rubber, felt cloth covered | 4 00 |
| **Deuce**—Made of good quality rubber, cloth covered | 3 00 |

## NETS

| No | Per L |
|---|---|
| **231X**—Tournament net, hand-made of 21 thread twine, bound at top with heavy 2 in. canvas [illegible] net is tarred. Double court, 42x3 feet | $10 00 |
| **160** —Made of 21 thread twine, bound with heavy 802 duck, with heavy loose top rope, so that it may be securely fastened to the posts. 42 feet. | 4 50 |
| **157** —As No. 160. 36 feet | 4 00 |
| **241 Double Center**—Made of 21 thread, doubled in the center, bound with heavy 10 ounce duck with loose top cord, black twine. 42 feet | 8 00 |
| **240** —As No. 241. 36 feet | 7 50 |
| **210** —As 241, white twine. 42 feet | 6 50 |
| **207** —As 240, white twine. 36 feet | 5 00 |

## CENTER NETS

| No. | Each |
|---|---|
| **100** —Not bound; 27 feet, 12 thread, single court | $ 1 00 |
| **106** —Not bound; 36 feet, 15 thread, double court | 1 25 |
| **109** —Not bound, 42 feet, 15 thread, double court | 1 50 |
| **106B**—Bound on top, 36 feet, 15 thread, double court | 1 75 |
| **109B**—Bound on top, 42 feet, 15 thread, double court | 2 00 |

## BACK STOP NETS

| No | Each |
|---|---|
| **119** —50x2 feet, 9 thread | $ 2 50 |
| **121** —50x8 feet, 12 thread | 3 50 |
| **121X**—50x8 feet, 12 thread. Tarred | 4 00 |

## NET POSTS

| Name or No | Per Pair |
|---|---|
| **Longwood Tournament** Made of Iron, green enamelled, fitted with rope reel | $22 50 |
| **Newport** —Made of yellow pine, iron ground sockets | 12 00 |
| **13½** —Rock maple, 1½ in. diameter, complete with guy ropes | 1 25 |
| **14½** Rock maple, brass turrules, steel spike at bottom, screw eyes for attaching net | 2 00 |
| **5** —Solid ash, 6 ft. long, allowing 2½ feet in ground, bracket at bottom to prevent post from being pulled forward, fitted with pulleys and reel | 8 50 |
| **4** —As No. 5, with 18 inch rest to ground and a little higher | 6 50 |

## MARKING TAPES

| No. | Per Set |
|---|---|
| **1** Strong webbing fastened to ground with pins and staples special tape for double courts, extra heavy, complete with 200 staples and 14 pins | 6 00 |
| **2/0** Double court, complete with pins and staples | 4 00 |
| **0** —Single court, complete with pins and staples | 3 50 |
| **Extra Galvanized Staples** | Per 100 50 |

# Wright & Ditson Tennis Goods

## RACKET PRESSES

| No. | | Each |
|---|---|---|
| 5/0 | —To hold two rackets | $ 2 50 |
| 0 | —For one racket | 1 00 |

## RACKET CASES

| No. | | Each |
|---|---|---|
| 0 | —Made of fine quality felt, opening at top of case | $ 50 |
| 3 | —Made of brown canvas, opening at top | 75 |
| 3P | —As No. 3, with pocket to hold three balls | 1 00 |
| 5 | —Made of fine mackintosh to keep out moisture | 1 00 |
| 6 | —Made of choice waterproof, lined | 1 50 |
| 8 | —Made of stiff leather | 5 00 |

## COURT MARKERS

| No. | | Each |
|---|---|---|
| 1 | —Made of tin, with wood handle | $ 2 00 |
| 0 | —As No. 1, with smaller handle | 1 25 |

drum have been increased, giving twice the area of the braking surface than that of the old model.

The brake band expands against the rotation of the hub. This is a radical departure from the old model. Opening against rather than with the direction of rotation makes it absolutely impossible for the brake to wind up, bind or lock. The brake responds instantly to the will of the rider who can gently retard the speed of his machine or come to an absolute halt by stalling his engine. These are the extreme possibilities. All degrees of braking results between can be attained by the application of proportionate back pedalling force.

In the new model also the old trouble of "picking up" the pedals has been eliminated, thereby avoiding the necessity of constantly changing position of the feet when riding.

The size of the brake has been increased, but not sufficiently to make the weight or size objectionable.

### NEW VEEDER MOTORCYCLE CYCLOMETER

Realization of the fact that small attachments on motorcycles are subjected to hard usage, has led the Veeder Mfg. Co., of Hartford, Conn., to bring a trip cyclometer designed specially for motorcycle use.

The case is larger, the gearing is heavier and it is fitted with a larger star-wheel than regularly used on a bicycle cyclometer, and the large motorcycle striker with adjustable bracket makes it a very durable instrument. The adjustable bracket can, by simply loosening one nut, be made to fit any make of machine. The mile figures are in white, with black background, the tenths of a mile in red, with black background.

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Three motorcycles are in use by the Police Department of Milwaukee, Wis., and the Chief of Police is making strenuous efforts to have the number increased to a dozen.

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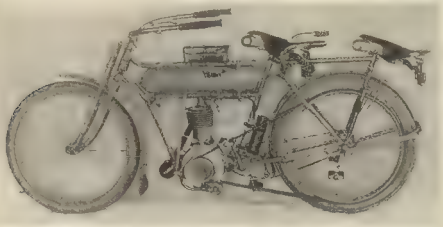
# 1910 "Yale" Motorcycles

For the coming season the Consolidated Mfg. Co., of Toledo, Ohio, maker of the Yale motor cycle is offering three models, one twin, one single flat belt and one single V-belt. The magneto ignition is the only ignition system used on the twin and is optional on the single.



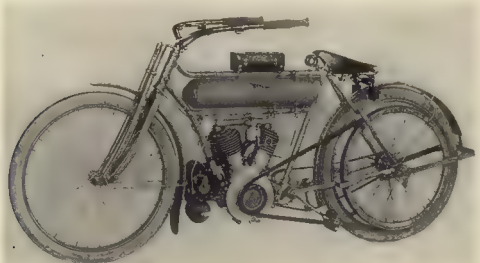
The Yale Single Cylinder 3½ H. P. Motorcycle, Right Side view, showing the same equipped with tandem attachment. 30.21 piston displacement, battery ignition or magneto at $35 extra; flat or V-belt; price, battery ignition, $200. Tandem attachment $30 extra.

The Yale 3½ H. P. single cylinder motor has a piston displacement of 30.21 cu. ins. The fly wheels weigh 31 pounds. The crank case is of aluminum. All bearings are forged from tool steel, hardened and ground and run in best bronze bearing metal. The valves are forged from nickel steel and the connecting rods are I-beam forgings. Three piston rings are fitted of the eccentric type. The cylinder, piston and ring are cast from metal patterns. An oil sight glass is fitted in the right hand side of the crank case. The exhaust and vibrator gear has a wide face, carefully hardened.

The twin cylinder motor has a piston displacement of 58 cubic inches. The cylinders are set at an angle of 45 degrees. One gear turned from solid bar, operates both exhaust valves and magneto. All the other specifications are similar to the single cylinder motor. The timer is simple and of compact form and is attached to the side of the gear case on main bearing. The contact points are iridium platinum and can be easily cleaned. The ignition is by jump spark from dry cells on the single cylinder machine. A Merz magneto is fitted at $35 extra.

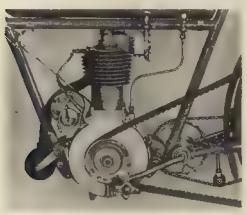
The twin cylinder machine is furnished with Bosch magneto as regular equipment. The Breeze float feed carburetor is regularly furnished. Control is by means of double grip from the handle bar.

brace. The connections are made from drop forgings and every joint is strongly reinforced. The rear forks are forgings and the head fittings are turned, carefully hardened.



The "Yale" Twin Cylinder Motorcycle; Motor 6½ H P. Cylinders set at 45 degree angle. Magneto Ignition. V Belt transmission; price $300

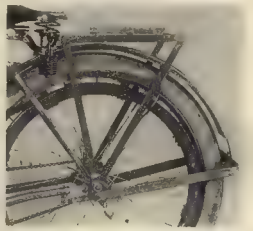
Particular attention is called to the design of the muffler, which is small and compact, and is claimed to be very efficient and to entirely eliminate back pressure. The battery box is located under the saddle and carries three No. 6 dry cells. It is



Right side view of the Single Cylinder Engine used on the Yale Motorcycle.

easy of access and entirely waterproof. The transmission is by 1¾, specially tanned, waterproof two-ply, endless belt. Proper tension is maintained by an idler operated from the seat. An idler is also fitted to the starting chain which allows adjustment to correspond with the belt. A V-belt is furnished as an option. The ignition coil is attached to the seat mast with switch plug in head. The frame is of special design affording low saddle position and center of gravity. Sixteen gauge, seamless tubing is used with an extra

The wheel base is 54½ inches, and the front wheels are fitted with 36 spokes and the rear wheels with 40 spokes. The gasoline capacity is 1½ gallons, carried in a tank set between top and truss bar in the frame. The lubricating oil is contained in a separate compartment in the gasoline tank and is forced into the crank case by a pump which is within easy reach of



Detail view of the Luggage Carrier and Stand attached to the Yale Motorcycle

the rider. The handle bars are long and are attached to the fork stem in a manner which makes turning impossible. Three inch mud guards are fitted. Tires are 28x 2½-inch clincher Morgan & Wright, or G & J. The Eclipse coaster brake is fitted and the front axle is of the knock-out type. The weight of the single cylinder

machine is 160 pounds, and that of the twin cylinder 190 pounds. The ratio of the single cylinder machine is 5¼ to 1 and that of the twin cylinder 4½ to 1. A luggage stand is attached to the rear fork ends and at an extra cost of $4. The price of the tandem attachment is $20.

The single cylinder machine lists at $200, with battery ignition and $235 with magneto, and the twin cylinder at $300.

# Answers to Motor Cycle Questions

(We desire not only our readers to make full use of this department, but any one who disagrees with the opinions herein expressed.)

## AIR COOLED TWO-CYCLE MOTOR-CYCLE ENGINE

[461.] Will you kindly give me your opinion as to whether or not I shall be able to successfully air cool a small 2¾ in. x 2½ in. three-cylinder two-cycle motor. This motor is to be used on a tandem motorcycle.

I propose to cast the cylinders with walls 1½ in. thick and turn the cooling flanges on in a lathe afterwards giving them a coat of copper 1-32 in. thick, copper applied by the electric plating process, when finished they will measure 3-16 in. x 1¼ in. with ¼ in. spaces between them.

Do you think this copper would peel off? At the top are pieces of ¼ in. copper tubing screwed into the cylinder head.

Inlet and exhaust manifolds are cast separate from cylinder and machined to a tight fit and attached with screws, ports to be drilled and machined after cylinder is finished.

GLENS FALLS, N. Y. J. F. REYNOLDS.

I should say that you do not need cylinder walls more than 3-16 thick at most, and that it would be better for the cylinder cooling, ribs to be thinner at the outer edge than at the root, and that the depth of rib should not be more than ½ in., or ⅝ at the most. The applied copper tube spines are difficult to place and fix, and probably would not suit you. The cooling projections, circumferential ribs or lengthwise ribs, or cooling spines should always be integral with the cylinder walls because heat does not pass a joining of parts readily.

Why not make a single cylinder and try various kinds of cooling projections, so as to know what you are doing before you build a 3-cylinder motor?

Or, if you do not want to find out for yourself, why not copy the work of others?

You do not need a coat of copper 1-32 thick to avoid rusting of cylinder cooling ribs. A very light coating of copper is enough; the thickness of tissue paper, say 1-1000 of an inch, is plenty for copper coating cylinders to prevent rusting.

It is easy to waste a good deal of time building little gas engines to meet your own ideas. Look at other men's motors, and copy prevailing practice. There are surely plenty of motorcycle cylinders to look at, almost all 4-cycle, but 2-cycle cylinders cool more readily than 4-cycle cylinders, although with the 2-cycle there are twice the 4-cycle burning charges, because the 2-cycle retains the burning charge so much less time.—H. D.

## HEADS SEPARATE OR INTEGRAL

[476.] I would like to ask a few questions on motorcycles. Will you please inform me which style of mechanical intake is the best, one in a separate chamber, or both intake and exhaust in one chamber? And would you tell me which style of cylinder gives the best satisfaction, head separate or cylinder and head cast in one piece?

FT LUPTON, COLO. CHARLES NELSON.

There is very little choice between the two types of mechanical intake valves you mention. In some of the highest class engines the mechanical inlet valve is located in the same chamber and on the same side of the engine as the exhaust valve. In others, it is located on the opposite side of the cylinders. As far as the efficiency of the engine is concerned it makes little difference whether the cylinder is cast in one piece or whether the head and the cylinder itself are cast in two pieces and later bolted together. The latter construction has the advantage that it is only necessary to remove the head in order to examine the piston and remove the carbon from its surface and from the surface of the combustion head itself.

TECH. COMM

## COMMUNICATION—FRONT FORKS TOO WEAK

Motorcycle manufacturers should take very good care in the making of the front forks, as when they break, as happened here recently, it is liable to do up the rider. The break took place on a common dirt road, and going not over 15 miles per hour. The rider was badly cut up, but what would the result have been at 30 miles, and on a hard state road? There is no excuse for making the forks light and defective; better add 4 or 5 pounds more metal and have it safe.

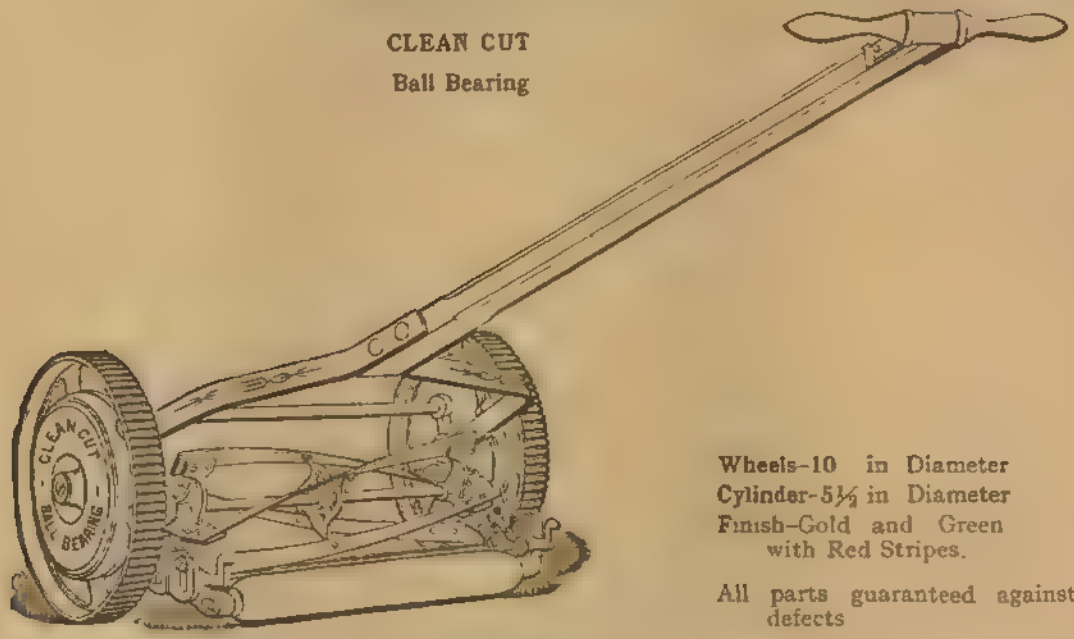
W. A. SIEGRAHN

We heartily agree with the writer of this communication, and also favor making the forks in such a way that the wheel cannot possibly drop out. This matter was discussed in our August issue, page 185.

# Lawn Mowers

## CLEAN CUT

**Ball Bearing**




**Wheels**–10 in Diameter
**Cylinder**–5½ in Diameter
Finish–Gold and Green with Red Stripes.

All parts guaranteed against defects

Patent Dead Knife, Positively Self-sharpening until the Knife is entirely worn out. Crucible Steel Blades Oil Tempered and Hardened, Adjustable Cut, Ball Bearings of latest improved pattern. All parts interchangeable.

**Four Blades**

| No. | Width of Cut | Weigh | Each |
|---|---|---|---|
| 412– | 12 in. | 50 lbs | $15.00 |
| 414– | 14 in. | 52 lbs. | 17 00 |
| 416– | 16 in. | 54 lbs | 19 00 |
| 418– | 18 in. | 58 lbs. | 21 00 |

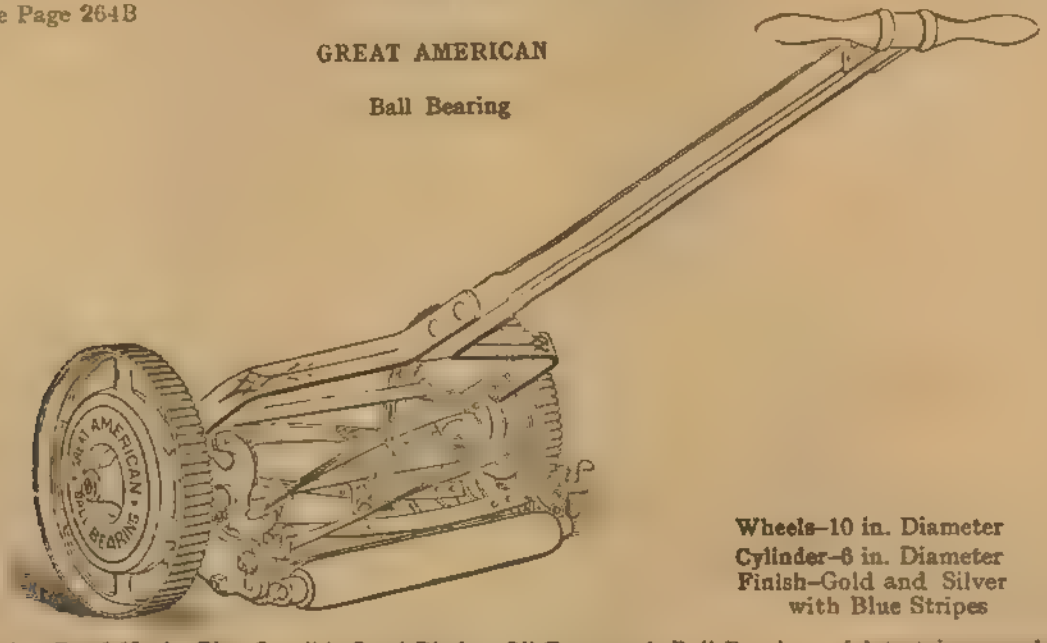
**Five Blades**

| No. | Width of Cut | Weight | Each |
|---|---|---|---|
| 512– | 12 in. | 54 lbs | $15.00 |
| 514– | 14 in. | 56 lbs | 17 00 |
| 516– | 16 in. | 58 lbs | 19.00 |
| 518– | 18 in. | 62 lbs | 21.00 |

For Extra Parts see Page 264B

## GREAT AMERICAN

**Ball Bearing**




**Wheels**–10 in. Diameter
**Cylinder**–6 in. Diameter
Finish–Gold and Silver with Blue Stripes

Patent Self-sharpening Dead Knife, Five Crucible Steel Blades, Oil Tempered, Ball Bearings of latest improved pattern
All parts interchangeable

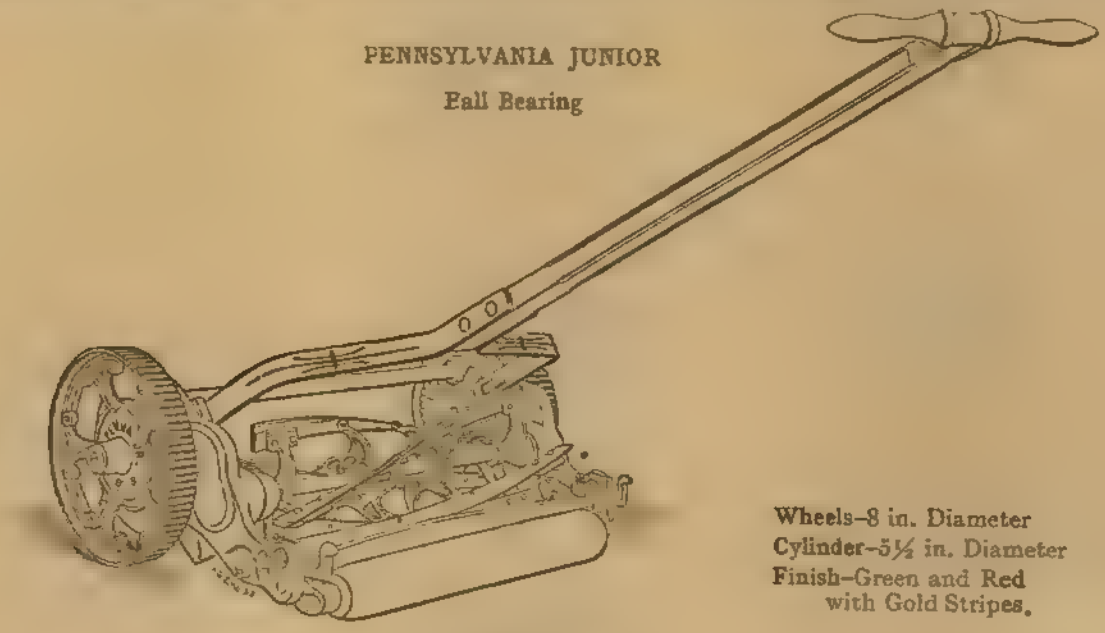
| Width of Cut | Weight | Each |
|---|---|---|
| 15 in. | 63 lbs | $25.00 |
| 17 in. | 66 lbs | 28.00 |
| 19 in. | 69 lbs | $31.00 |
| 21 in. | 74 lbs | 34.00 |

# Lawn Mowers

The "Pennsylvania Junior" Lawn Mowers have a Train of Gears on Each Side, also Dust Proof Ball Bearings on Each Side, adjusted by a single Screw in the Cone, with an Eccentric Point which fits into the Cylinder Axle. These Mowers have a patented Stationary or Dead Knife of Crucible Steel, the Construction making it positively self-sharpening until entirely worn out.
The Cylinder has five Crucible Steel Knives Hardened and Tempered in Oil. Ball Bearings of latest improved pattern

## PENNSYLVANIA JUNIOR

**Ball Bearing**



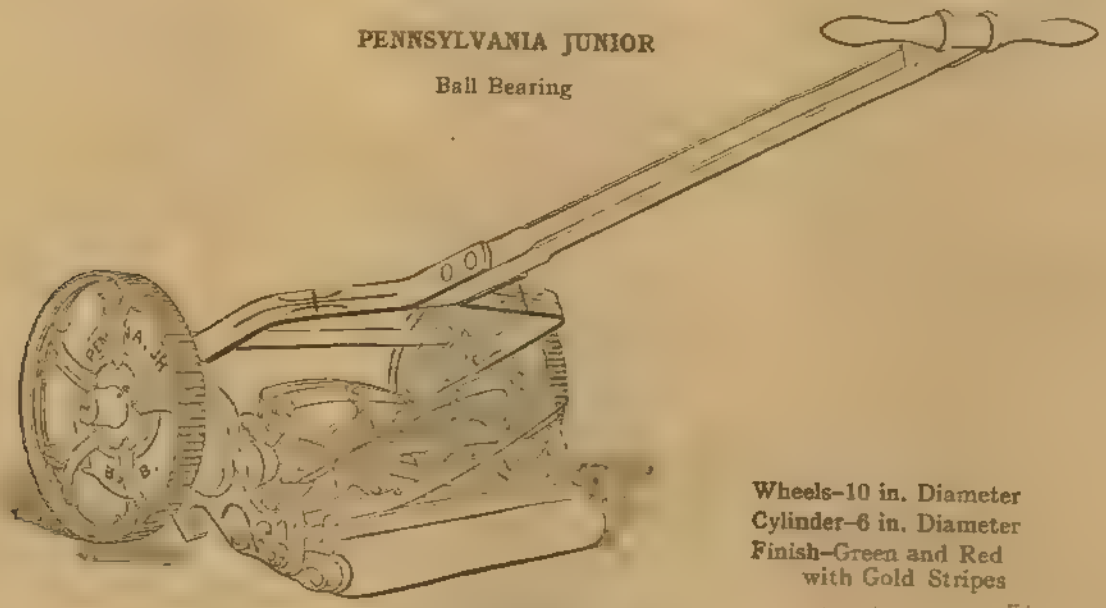
Wheels–8 in. Diameter
Cylinder–5½ in. Diameter
Finish–Green and Red with Gold Stripes.

**Low Wheel**

| Width of Cut | Weight | Each | Width of Cut | Weight | Each |
|---|---|---|---|---|---|
| 12 in | 58 lbs | $15.00 | 16 in. | 64 lbs. | $19.00 |
| 14 in. | 61 lbs | 17.00 | 18 in. | 70 lbs | 21.00 |

## PENNSYLVANIA JUNIOR

**Ball Bearing**



Wheels–10 in. Diameter
Cylinder–6 in. Diameter
Finish–Green and Red with Gold Stripes

**High Wheel**

| Width of Cut | Weight | Each | Width of Cut | Weight | Each |
|---|---|---|---|---|---|
| 15 in. | 69 lbs | $25.00 | 19 in. | 77 lbs | $31 00 |
| 17 in | 73 lbs | 28.00 | 21 in. | 80 lbs. | 34.00 |

# Lawn Mowers

## SUNSET
**Ball Bearing**

**Wheels**—8 in. Diameter
**Cylinder**—5 in. Diameter

**Finish**—Blue and Gold

Four Tool Steel Knives. Hardened Patent Flexible Dead Knife. Patent Adjustable Ball Bearings

| Width of Cut | Weight | Each | Width of Cut | Weight | Each |
|---|---|---|---|---|---|
| 12 in. | 38 lbs. | $7.00 | 16 in. | 42 lbs. | $ 9.00 |
| 14 in. | 40 lbs. | 8.00 | 18 in. | 44 lbs. | 10.00 |

## TROJAN

**Wheels**—8 in. Diameter
**Cylinder**—5 in. Diameter

**Finish**—Green and Red

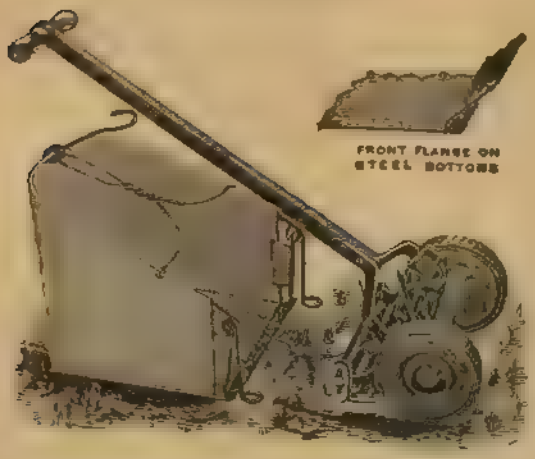
Three Tool Steel Knives. Hardened Patent Flexible Dead Knife. Adjustable Steel Brass Bearings

| Width of Cut | Weight | Each | Width of Cut | Weight | Each |
|---|---|---|---|---|---|
| 10 in. | 34 lbs. | $5.00 | 14 in. | 38 lbs. | $6.00 |
| 12 in. | 36 lbs. | 5.50 | 16 in. | 40 lbs. | 6.50 |

For Extra Parts see Page 264B

# Grass Catchers

## EASY EMPTYING



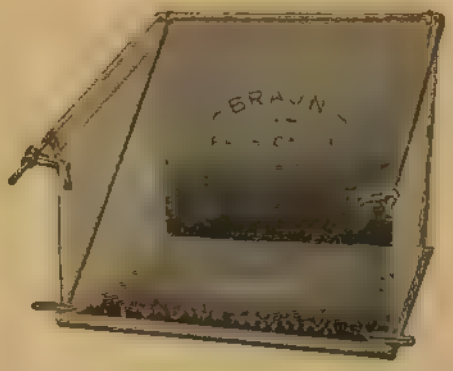

Has new Improved Handle, Front Flange, and Hook Brackets. Hook is permanently attached to Catcher, and hooks over Handle of Mower. Catcher is attached and detached instantly with one hand. Hook drops down parallel with Handle of Catcher.

**Galvanized Steel Bottom, Heavy Duck Sides**

| No. | Width | For Mowers | Per Doz. |
|---|---|---|---|
| 5 G– | 18 in. | 12 to 18 in. | $18.50 |
| 12 G– | 22 in. | 18 to 22 in. | 22.00 |

One Dozen in a light Wooden Box

## BRAUN




Entirely free from handle of Mower. Supported on Truss Rods giving strength and firmness. Sliding adjustable Clamps hook over Handle Braces. Can be attached or detached instantly, or dumped forward without detaching. Folds flat for shipment.

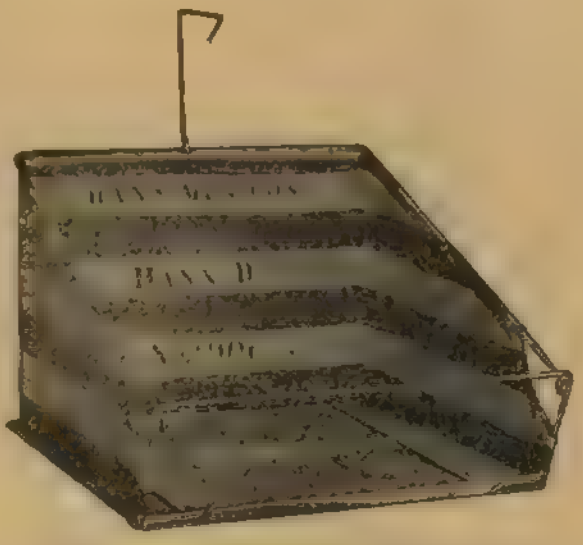
**Galvanized Steel Bottom. Heavy Canvas Sides.**

| Width | For Mowers | Per Doz. |
|---|---|---|
| 12 in. | 12 in. | $36.00 |
| 14 in. | 14 and 15 in. | 39.00 |
| 16 in. | 16 and 17 in. | 42.00 |
| 18 in. | 18 and 19 in. | 45.00 |

## HANN-D

Duck Bottom and Sides, Brace Front, 8 in. Deep, Fits 12 to 16 in. Mowers

| No. | Per Doz. |
|---|---|
| 3–Hann-D | $12.00 |



Galvanized Bottom, Duck Sides, Braced Front, 12 in. Deep, Fits 12 to 16 in. Mowers

| No. | Per Doz. |
|---|---|
| 1001–Hann-D | $18.00 |

# Silver Plated Ware

**1847 ROGERS BROS.** XS TRIPLE

All "1847 Rogers Bros." are plated with pure silver on the best quality of 18 per cent nickel silver, are warranted in every respect and are accurately weighed before and after plating to conform with the following standard

XS TRIPLE **Plate—Plated over three times heavier than the ordinary standard.**

Windsor—Bright or Satin Finish Shell—Bright

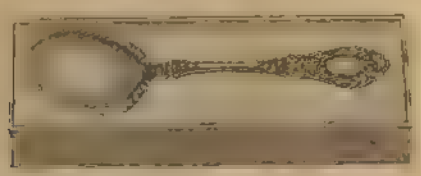
**Windsor and Shell Patterns**

| | | | |
|---|---|---|---|
| Tea Spoons | $ 4 25 | Soup Spoons | $8 50 |
| Dessert Spoons | 7 50 | Dessert Forks | 7 50 |
| Table Spoons | 8 50 | Medium Forks | 8 50 |

Vintage and Sharon Patterns

| | | | |
|---|---|---|---|
| Tea Spoons | $ 4 75 | Soup Spoons | $9 50 |
| Dessert Spoons | 8 50 | Dessert Forks | 8 50 |
| Table Spoons | 9 50 | Medium Forks | 9 50 |

Packed One Dozen in a Box



**Sharon Sugar Shell No. 608**

| | Per Doz. |
|---|---|
| Sharon, French Gray Finish | $10 50 |
| Vintage, French Gray Finish | 10 50 |
| **Wildsor,** Satin Finish | 10.50 |
| **Shell,** Satin Finish | 10.50 |

**Vintage Butter Knife No. 609**

| | |
|---|---|
| Vintage, French Gray Finish | $ 2 00 |
| Sharon, French Gray Finish | 12.00 |
| **Windsor,** Satin Finish | 12 00 |
| **Shell,** Satin Finish | 12 50 |

Packed in lined boxes

# Silver Plated Ware

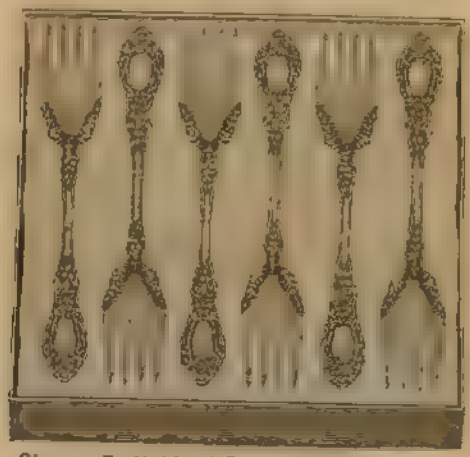
1847 ROGERS BROS. XS TRIPLE

Vintage Butter Knife and Sugar Shell No. 604

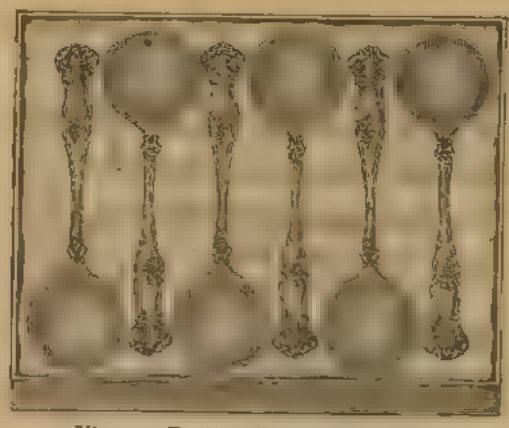
| | Per Set |
|---|---|
| Vintage, French Gray Finish | $1.84 |
| Sharon, French Gray Finish | 1.84 |
| Windsor, Satin Finish | 1.84 |
| Shell, Satin Finish | 1.84 |

Vintage Butter Knife, Sugar Shell and Cream Ladle No. 702

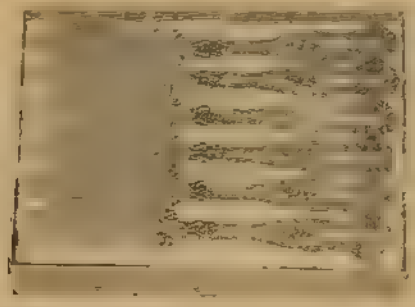
| | Per Set |
|---|---|
| Vintage, French Gray Finish | $3 25 |
| Sharon, French Gray Finish | 3 25 |



Sharon Individual Salad Forks, No. 717 — Per Doz.
Sharon and Vintage, French Gray Finish — $9.50

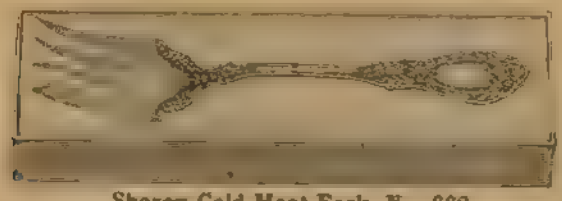


Vintage Bullion Spoons, No. 720 — Per Doz.
Vintage and Sharon, French Gray Finish — $9.00



Vintage Individual Butter Knives, No. 652 — Per Doz.
Vintage and Sharon, French Gray Finish — $8.50

Sharon Coffee Spoons, No. 624 — Per Doz.
Sharon and Vintage, French Gray Finish — $4.70



Sharon Cold Meat Fork, No. 662 — Per Doz.
Sharon and Vintage, French Gray Finish — $15.00

Vintage Tomato Server, No. 714 — Per Doz.
Vintage and Sharon, French Gray Finish — $30.00

# Silver Plated Ware

1847 ROGERS BROS. XS TRIPLE

**Sharon Salad Fork, No. 755** — Per Doz.
Sharon and Vintage, French Gray Finish ... $30.00

**Sharon Salad Spoon** — Per Doz.
Sharon and Vintage, French Gray Finish ... $24.00

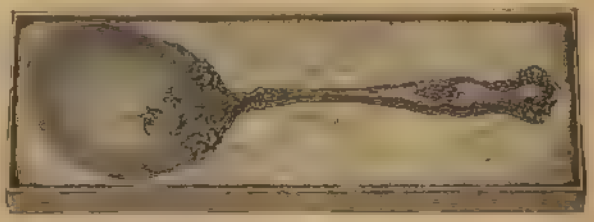
**Vintage Salad Set, No. 639** — Per Set
Vintage and Sharon, French Gray Finish ... $4.50

**Sharon Oyster Forks, No. 622** — Per Doz.
Sharon and Vintage, French Gray Finish ... $6.30

**Vintage Child Set with Flat Handle Knife, No. 116** — Per Set
Vintage and Sharon, French Gray Finish ... $2.00

**Vintage Child Set with Hollow Handle Knife, No. 593** — Per Set
Vintage and Sharon, French Gray Finish ... $2.62

**Vintage Pie Server, Hollow Handle** — Per Doz.
Vintage and Sharon, French Gray Finish ... $36.00



**Vintage Berry Spoons, No. 615** — Per Doz.
Vintage and Sharon, French Gray Finish ... $24.00

**Vintage Pickle Fork, Long Handle, No. 631** — Per Doz
Vintage and Sharon, French Gray Finish ... $12.00

All above packed in lined boxes

# Silver Plated Ware

**1847 ROGERS BROS.** XS TRIPLE

**Sharon Gravy Ladle**

**Medium Soup Ladles** — Per Doz.

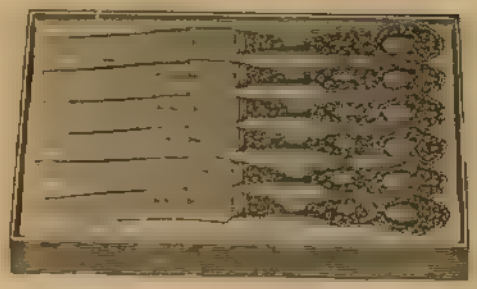
**Sharon** and **Vintage**, French Gray Finish..... $48.00

**Gravy Ladles**

**Sharon** and **Vintage**, French Gray Finish ..... 18.00

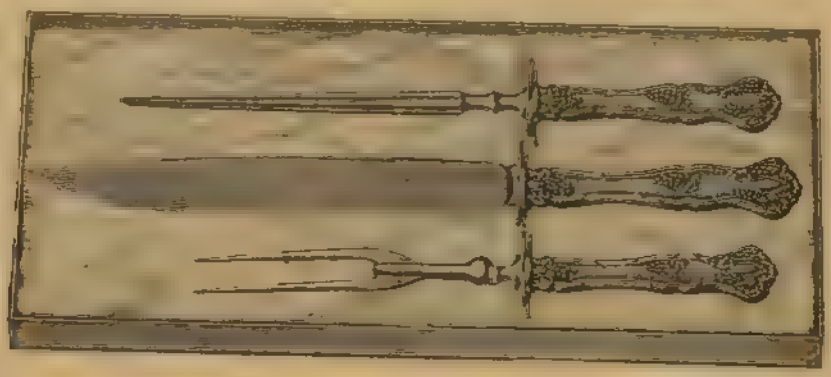
**Cream Ladles**

**Sharon and Vintage**, French Gray Finish ..... 13.50



**Sharon Hollow Handle Fruit Knives, No. 1**

| | Per Doz. |
|---|---|
| **Sharon**, French Gray Finish | $12.00 |
| **Vintage**, French Gray Finish | 12.00 |



**Vintage Three-Piece Meat Carvers**

**Vintage** and **Sharon**, French Gray Finish Handles Polished Steel 9 inch Blade ..... Per Set $10 00

**Vintage Two-Piece Game Carvers**

**Vintage** and **Sharon**, French Gray Finish Handles Polished Steel 7 inch Blade ..... Per Pair $7 00

**Sharon Two-Piece Bird or Steak Carvers**

**Sharon** and **Vintage**, French Gray Finish Handle Polished Steel 6 inch Blade ..... Per Pair $4 50

# The 1910 Hart-Kraft Models

Since publishing the description of the 1909 Hart-Kraft models in our last issue, we find that the 1910 line is ready for the market with several important changes and improvements which we are outlining in this article. Although the general lines of the car are about the same as the 1909 models, several changes have been made in the construction which will make the 1910 cars even more staunch and

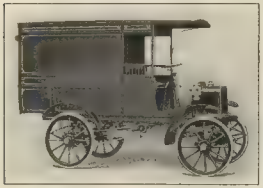


Fig. 1. Hart-Kraft Model B 5T fitted with removable top converting same into an open delivery body. Motor 4¼ by 4, cylinders offset, motor and planetary transmission forming a three point suspended power plant on an individual angle steel frame.

serviceable than those of last season. All of the Hart-Kraft commercial vehicles for the coming season are based on a single chassis, which, as in last year's cars, is provided with a two-cylinder opposed planetary combination forming a unit power plant mounted on a three point suspension. The motor, however, has been increased in size to 4¼-in. by 4-in. and a change has been made in the form of the piston rings which makes them an exceptionally close fit in the cylinders, their ends are now step jointed instead of diagonally cut and the rings are somewhat heavier and more eccentric, three of these are used above the pin, giving a good permanent compression. The frame of the chassis is of oak reinforced by steel plates as in previous models and is 10 ft. 6 in. in length and somewhat lower than that used in the 1909 models. All types of bodies, there being eight different styles, are supplied on this chassis, thus meeting the requirements of most any class of light delivery service, as these cars are designed for 1,000 pounds paying load.

When interviewed by our representative in regard to the prices of the 1910 line, Mr. Hartman, president of the Hart-Kraft Motor Co., of York, Pa., stated that definite figures could not well be given as these depended entirely upon the style of body and the equipment required for the special kind of delivery that is desired, and that almost no two purchasers require exactly the same outfit. However, the prices will range between $1,200 and $1,500 for the coming season.

The bodies supplied are of the open delivery type without top, panel delivery types, side screen bodies with curtains and state bodies. These bodies can be arranged with various platform areas obtained by changing the rear overhang to suit special requirements. The standard types, however, are known as B3, a panelled body as shown in figure 3, the dimensions back of the seat being, length 60 in., width 45 in. and height 58 in.; model B4 a larger panelled body with the following dimensions, length 65 in., width 48 in. and height 60 in.; and model B6 with screen, oil duck side curtains. Model B5 as shown in Fig. 1 is fitted with a removable tonneau and is designed especially for carrying material of considerable bulk, but of comparatively little

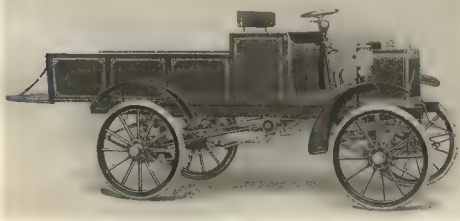


Fig. 2. View of the Hart Kraft 1910 Model B3, open delivery body. Power plant same as in Fig. 1. Carrying platform 78 in. length, 40 in. width; gasoline capacity 10 gallons, two speed and reverse planetary transmission; multiple disc clutch, capacity 1,000 pounds, in addition to two operators; 34-in. wheels fitted with 2½ in. tires.

weight. The dimensions back of the seat are 73 in., width 40 in. and height 60 in. The model B5 as shown in Fig. 2 has the same carrying platform, but is open as shown.

Fig 3 View of the Model B3 panel delivery body, dimensions back of seat are: length 60 in., width 45 in ; height 45 in. Armored wood frame, two-cylinder opposed water cooled motor, 4¼ by 4 Same chassis specifications as the other models

NEW OILING SYSTEM

One of the changes is in the oiling system, the method employed being a combination of force feed and splash lubrication. A compression oiler operated from the change in pressure in the crank case, forces oil to both of the cylinders at their upper sides. The feed is so adjusted that there is also maintained a splash pool into which the connecting rods dip. A new compression relief valve has been placed on the crank case and so constructed that no oil can be thrown out of the case.

The cylinders are offset, one being half an inch above the centre line of the crank case and the other one one-half inch below. This equalizes the wear on the cylinder walls, gives a more direct thrust on the connecting rod and prevents one cylinder from receiving more than its due share of oil from the splash, in other words, to a certain extent, equalizes the amount of oil received by the two cylinders.

CHANGES IN UNIT POWER PLANT

Although the unit power plant construction has been retained, several changes have been made which facilitate its rapid removal or replacement in the chassis. As in 1909 the ends of the jack shaft form the two rear supports but are now held by a hinged cap which supports the heavy duty Hyatt roller bearings which have replaced the plain bearings of last season, thus by releasing one nut at each side the entire power plant can be lowered out of the chassis. The bolts holding these caps are of extra size and the nuts locked. The radius rods have been altered in design so that their forward ends are now attached to the bracket riveted to the frame members and which support the outboard bearings of the jack shaft. With this construction it is not necessary to remove the radius rods when removing the power plant.

Refinements have been made in the cam shapes which have resulted, it is claimed, in a valve setting which gives almost 20 per cent. more power from the engine as shown by tests.

The weight of the fly wheel has been increased to about 90 pounds and it has fan blade spokes as last year. The connecting rod and main bearings are now of Parsons White Brass die cast.

The planetary type of transmission has been retained for 1910 although several changes have been made in the construction. At the rear of the case is now fitted

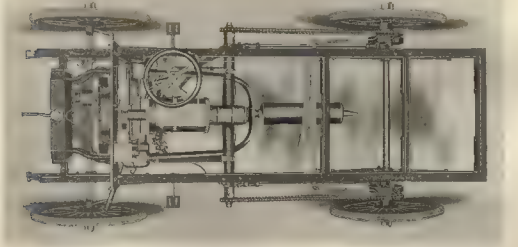


Fig. 4. Plan view of the Hart-Kraft 1910 chassis showing the armored wood frame side chain drive arrangement of brake evenes three point suspended unit power plant which can be dropped out of the frame by reiessing the bolts retaining hinged caps which support the jack shaft out-board bearings. Full elliptic springs are used both front and rear. Ignition is by magneto with dry cells as an auxiliary Wheels 34 in. fitted with 3½ solid rubber tires, capacity 1000 pounds pay load.

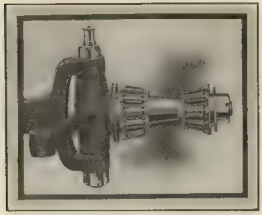


Fig. 5. The 1910 steering knuckle, stub shaft and Hyatt roller bearings on the front wheels, the steering spindle has been increased from 1⅝ to 1⅝ in.

a crucible steel cast head which carries two Timken roller bearings so arranged that they can be moved end-wise as a unit providing a means for properly meshing the large bevel driving gear and bevel pinion, or can be adjusted individually toward or away from each other. A change has also been made in the construction of the transmission shafts so that they can be more easily disassembled. The transmission now used is of the two pinion type, instead of three, giving larger and more substantial gears.

Many of the parts, such as wheels and hubs, have been made heavier and malleable iron castings have been replaced by crucible steel. Several changes have been made in the axles. The steering spindles have been increased from 1⅜-in. to 1⅝-in. dia. and the steering connections are also somewhat larger. All of these rods are fitted with spring pressed blocks gripping the balls on the rods, thus relieving the steering mechanism of excessive road shock. The 36-in. wheels of last year have been succeeded by 34-in. wheels with 2½-in. solid tires, these tires being ½ in. larger than those used last year, giving a greater cushioning effect.

Perhaps one of the most important changes has been in connection with the rear axle construction. This member now being a solid nickel steel bar 1⅝-in. dia. over the ends of which are forced and shrunk on Shelby steel tubes, thus forming a shoulder for the wheel hub without cutting into the axle itself. Over this steel tubing a split crucible casting whose functions are threefold, is clamped. This casting forms the spring block which comes on the under side of the axle, it also forms the brake stand and acts as a support for the yoke of the distance rod. A bolt is arranged to pass up through the spring block and springs and heavy U shaped clips hold the springs rigidly in position, the nuts being on the upper side.

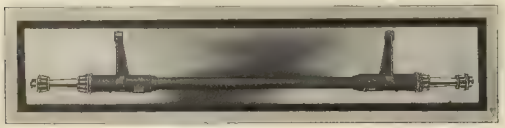


Fig. 6. The 1910 rear axle of solid nickel steel 1⅝ dia. fitted with Timken roller bearings.

Fig. 7. Hart-Kraft jack shaft showing the heavy duty Hyatt roller bearings and the large bevel gear differential now used in the construction.

The light spur differential of last year has been replaced by a heavy brown light differential of bevel gear type, the gears having 5-7 pitch, the bearings on the jack shaft are now of the heavy duty Hyatt roller bearing type and the jack shaft itself has been increased from one inch to one and one-quarter inches. A heavy Hyatt bearing is also used next the differential and a ball thrust bearing replaces the thrust collar formerly used. All transmission pinion studs are of nickel steel and the various gears and parts are alloy steel heat treated.

The valves are now made with nickel steel heads, electrically welded to machinery steel stems.

The ignition is practically the same as before, a Splitdorf magneto supplying the current, this usually being used for starting as well, although dry cells are provided as an auxiliary equipment. One of the magneto driving gears has now been changed to fibre giving a more quiet combination.

The changes in the change speed mechanism and in the wheels now give a ratio of 15 to 48 teeth at the bevels and 15 to 30 at the chains, which with 43-in. wheels gives a ratio of about 6 4-10 to 1 on the direct drive.

One of the features most noticeable, in the changes for 1910, is the change to higher grade material in many of the parts, especially in the gears and bearing metals and the use of anti-friction bearings and thrusts where plain bearings were formerly used. All bearing surfaces, such as cylinders, rings, holes in transmission gears where they bear on the studs, crank shaft and wrist pins, etc., are now finished by grinding.

## B. E. ODELL CO. WILL REPLACE HORSE-DRAWN EQUIPMENT WITH MOTOR TRUCKS

This concern, located in Syracuse, N. Y., is using motor trucks for jobbing oysters and fish to retailers and delivering retail orders. At present only one car is in use, the same having been purchased in September, 1908. It is a Chase truck, 10 H. P., manufactured by the Chase Motor Truck Co., and cost $750. The motor is 2-cycle, air-cooled.

On an average of 300 pounds are carried, but sometimes as high as 1,200 pounds are loaded on the truck. In the winter time on an average of 25 miles are made daily, while in the summer time only about half as many are made. The total cost for repair work and repair parts from September 13, 1908, to June 1, 1909, is figured at $83. The operator's wages are $10 per week. The truck is fitted with solid tires, which last about six months, and cost $65 for a new set. This car has replaced two horses and two vehicles of the open express body type. The wagons carried a load of from 300 to 1,200 pounds. The average daily mileage of both rigs is about 25 miles in winter. The horses cost $150 each, the wagons $90 each and harness per set $20. The average monthly cost of horse and feed is $20 and shoeing $3.50.

This concern thinks the motor ought to have three cylinders instead of two, and the H. P. should be about 15, in order to fully meet with their requirements. The advantages claimed for the motor car over the horse and wagon are that the motor car does twice the business of the horse-drawn vehicle and helps to advertise the business. They also state that the motor car is less trouble to take care of. This concern has made all the improvements they thought necessary and now has a wagon at the factory that embodies all the best ideas of a dozen or so users besides the manufacturer. Mr. B. E. Odell, Secretary of the Company, says that every firm should have at least one motor truck and give it all the long hauls and hard work Mr. Odell has used other trucks built on pleasure car chassis, but believes that combination is not practical. This concern is installing motor trucks as fast as their horses and wagons can be disposed of.

## USING FIVE MOTOR CARS SUCCESSFULLY IN EXPRESS BUSINESS

Abbott Miller, 64 Washington street, Quincy, Mass., is using five motor cars in connection with his express business. These cars have been in use for the last three years and are manufactured respectively by the Oscar Lear Auto Co. and the Autocar Mfg. Co. Three of them are 25 H. P. each, and the other two are 40 and 50 H. P. respectively.

These cars carry an average weight of load of 2½ tons for the 25 H. P. car, one ton for the 40 H. P., and three tons for the 50 H. P. On an average of 50 miles are made with four of the cars and 75 miles with the remaining one. One of the cars makes three trips daily—50 calls per trip, and the other four are used for trunk line work. The average monthly cost of gasoline for each car is $27.50 and of lubricating oil $6. This concern stores the cars in its own garage, which is fitted with a complete repair shop. The average monthly wages of each operator is $90.

This concern claims that one car does the work of four horses and sometimes six or eight. They state that a two-horse team is good for about three tons. The average weight of load carried on the horse-drawn vehicles formerly used was somewhat over two tons. The average daily mileage was 22. Three trips were made per day and 25 calls per trip. The cost of each horse was $225, harness

# The DeShaw Two-Cycle Motor Car

In the suburbs of Brooklyn, N. Y., in a modest factory, is being built a very interesting example of what can be done with the modern two-cycle engine as applied to motor car propulsion. We refer to the DeShaw two-cycle car, built by the DeShaw Motor Co., 50 Summerfield street, Evergreen, L. I. This firm has carried on two-cycle experiments for several years until the present four-cylinder, two-cycle motor, which weighs complete but 250 pounds and develops on the brake 28 H. P., is the result. A three-cylinder motor

Fig. 1 View of the DeShaw two-cycle four-cylinder and 28 H P touring car which shows the shutter-like front to the hood corresponding to the radiator on water-cooled cars This front having taken the place of the open fronts usually used on air-cooled cars The motor is of the three port type and has a bore of 3⅝ and a stroke of 3½ in and at 1200 revolutions develops 28 H P The piston baffle plate is hollow and cast integral with the cylinder. A special oiling system is used, and the crank case pressure is 6½ lbs. gauge. Speed tests are described in the text. Touring car $2,250, Runabout $2,150.

is also made. The idea for these two-cycle engines was originated and perfected by Chas DeShaw, the designer and engineer of the company. One of the features which is prominent in this motor is its simplicity. All cam shafts, gears and all valve operating mechanism are of course absent. The officers of the company are: P. H. Clark, president; W. E. Vogt, vice-president; S. W. Bates, treasurer; and E. W. Lester, secretary, and Chas. DeShaw, mechanical engineer and superintendent.

The motor is air cooled, no trouble whatever being experienced, it is claimed, in cooling these two-cycle cylinders, in fact, models have been run for a considerable period without any fan without sufficiently overheating to get a preignition. However, a fan of the ordinary type V belt driven from an aluminum pulley on the engine shaft, is supplied and the flywheel spokes also form fan blades, thus giving the motor ample protection against abuse by overheating in the hands of inexperienced operators. The motor is of the three port type with screens fitted into the by-pass chambers which latter are made an integral part of the cylinders. Expansion or cover plates are fitted at the top. The actual screen is placed between thin plates drilled with a large number of holes to give sufficient area but still have a body of metal large enough to effectually prevent the screen from ever becoming heated, thus it is impossible for the motor to back fire. The cylinders are cast separately with very deep integral flanges which are quite thick at their outer edges, giving a large radiating surface. Around the top of the cylinder, these flanges are much deeper than at the bottom. The fan is mounted on a stud screwed into a boss on the forward cylinder.

The bore is 3⅝-in. and the stroke 3½-in. and at 1,200 revolutions a brake horse power of 28 is developed. The exhaust manifold is a one piece iron casting with arms or branches to each cylinder, these being about 8-in. in length, thus carrying the heat away from the cylinder heads. To assist in cooling, the hood is closed except at the front where it is built in the form of a window shutter having horizontal transverse slats which allow the air to freely pass but effectually hide any view of the interior. The inlet manifold is also a one piece casting of aluminum, being a U at each end of which is another U the ends of which each supply a cylinder or

rather supply the third port to the crank case of each of the cylinders.

The crank case is a two piece aluminum casting of interesting design, the lower half forming a web extending to the sub-frame side members, completely protecting the underside of the car, this, however, not being as essential in this case as it would be with a four-cycle engine as there are no gears, springs or valve lifting rods to protect. The interior of each crank compartment is extremely small, giving only sufficient clearance for the I section special bronze connecting rods to swing. No nuts are used on the ends of the connecting rod caps to further reduce the size of the rod end, the caps being held each by two 7-16-in. fillister head cap screws which pass through the caps and are threaded into the rod itself and are prevented from loosening by a small curved piece of steel, the ends of which fit into slots in the screw heads and which is retained in position by a small screw in the cap. The pistons are comparatively long being 4⅝-in., the baffle plate is a hollow integral projection on the cylinder head and is opened to the cool gases of the crank case. This baffle plate is ⅞-in. in height. This plate is straight for two-thirds of its length, curving to its cylinder walls at the end and is set about its own height from the cylinder wall. There are four ⅜-in. eccentric diagonally cut rings, three at the top and one at the bottom. These rings are of course pinned in order to pass the ports. There seems to be no peculiarity in the port openings or arrangement, the results obtained being due to their being suitably placed for the particular engine in question. Each port has a vertical flat bridge at its centre.

At the bottom of each of the crank case pits, a small removable plate is fitted giving access to the connecting rod ends when desired.

The wrist pin is a hardened steel tube 15-16-in. diameter, prevented from side slip by a tight fitting split pin passed through the piston boss and into the inside of the hollow pin where the ends are spread.

In the cylinder head is a brass screw cap tapped to receive at the centre a spark plug and at one side a priming cup. This brings the spark plug directly over the centre of the cylinder, the bypass screen is of rather course make so that the area is not too much cut down and so that it will not readily clog, no trouble, it is claimed, has ever been experienced from this source since the large mesh was used.

A crank case pressure of 6½ pounds gauge, engine turned over by hand, is obtained. The cylinders are held to the webbed aluminum crank case, each by four studs and the engine itself is mounted upon the sub-frame by four channel section integral aluminum arms from the upper portion of the case. The crank shaft is a carbon steel drop forging, mounted in 3⅜ by 1⅞-in. Hewitt babbit bearings there being five of these long bearings in all, making each crank case compartment entirely separate.

THE OILING SYSTEM

The method of lubricating a two-cycle engine is one of the problems of the designer, it being admitted that the ordinary splash system is not as desirable as in the four-cycle type. The method of lubrication adopted for the DeShaw motor is simple yet effective and consists in using a Makenzie six lead force feed oiler placed at the forepart of the motor and belt driven from the engine shaft. Five leads are carried to the five main bearings to a reservoir under the lower half of each bearing. This underfeed system having the advantage that after the motor is stopped the oil does not continue to flow over into the case thus causing smoking from excess of oil when the engine is again started. The sixth lead feeds directly into the intake pipe between the carburetor and the engine, the oil is thus carried with the mixture in sufficient quantities to take care of the pistons and the entire inside of the case always has sufficient oil mist to take care of the connecting rods. A very small amount of oil is usually found standing at the bottom of the case.

SPECIAL CLUTCH.

A specially designed clutch of the internal expanding type has been designed and tested and is now used regularly in the DeShaw models, this clutch consists essentially of a bronze expanding band, 6⅛-in. dia. and 4-in. face, which expands against the inside of the flywheel hub and is carried by a cage consisting of two plates of McAdamite metal which are held together by through bolts. In the surface of the expanding band are three series of ⅜-in. oil holes connected by a shallow groove which allows the oil from the interior of the clutch to find its way between the acting metal surfaces. The clutch is mounted, or centered, on a bearing on an extension of the crank shaft and the expanding band acts against the inside surface of the enlarged hollow hub of the flywheel so that the metal surfaces are bronze against steel. The forward end of the transmission shaft is enlarged and milled to form lugs which grip similar lugs on a steel plate, bolted to the rear McAdamite metal casting, which forms one side of the cage enclosing the expanding band. The oil holes in the band are so arranged that the oil is continually carried to the back of the clutch, keeping the face of it clean. This clutch is expanded by a rotary piece notched to engage one end of the band, this piece has an arm the end of which is fitted with a hardened steel roller which rides upon an incline on a cone which slides on a spline on the clutch shaft, this cone is moved toward or away from the clutch,

thus expanding or contracting the band. It is actuated by means of the usual yoke on a transverse shaft under the control of the clutch pedal. The ends of the yoke arms are also provided with hardened steel rollers to prevent wear at this point. This pedal operates the clutch alone and is not in any way interconnected with the brakes. It is claimed that the clutch is capable of transmitting 60 H. P. The flywheel is of cast iron, weighs about 74 pounds, is 17-in. in dia. and 3½ face and has six fan blade spokes cast integrally. The clutch will hold about a wine glass full of oil which can be introduced through holes provided for the purpose.

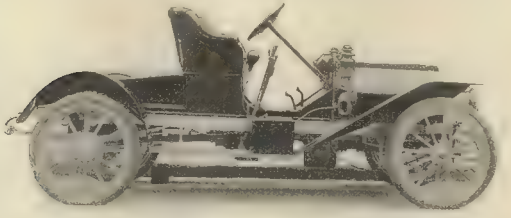


Fig. 2 DeShaw Runabout fitted with two-cycle engine. This little car has a 4-cylinder 2-cycle engine of 28 H. P. which is air cooled. A special expanding band metal to metal clutch is used and the change speed mechanism is of sliding gear type giving three speeds forward and one reverse. Drive is by enclosed Cardan shaft to the bevel gear rear axle.

Between the clutch and the transmission is a short removable clutch shaft, the forward end of which engages lugs at the rear end of the transmission as mentioned, and the rear end of this shaft engages lugs on the transmission line shaft. The piece at the rear end can be slid forward on its rear shaft by releasing a locking collar which makes it possible to remove the short shaft so that the clutch and transmission can be taken out, without interfering with any other parts of the car.

CHANGE SPEED GEAR.

The change speed gears which allow three speeds forward and one reverse are housed in a very compact one piece aluminum case supported on the sub-frame by four integral channel section arms, the entire top of the case being removable for inspection, cleaning and oil renewal. This case is 8-in. long by 8⅛-in. wide. The lay shaft is below the line shaft. All gears are of open hearth steel, pack hardened. The gear operation is by a swinging side lever, giving selective control. The levers controlling the sliding gear members are all contained within the change speed gear case so that there is no chance for an oil leak. The gear shifting arm inside the case is mounted on a corrugated taper milled in the end of the cross shaft which meshes with corrugations on the inside of an eye cut in the rod, tube being held as usual with a taper by means of a lock nut. The lever when swung inward, that is, toward the driver and pulled to the rear, gives the low speed and when pushed forward and a latch released by a slight downward pressure on a finger rest, gives the reverse. In the outward ahead position second speed is obtained and when the lever is pulled to the rear it engages the high speed by means of lug clutches. The gear ratio on the high is of course 1 to 1, for the intermediate 1 to 5, the low 3.36 to 1, reverse 4.32 to 1 and the reduction at the rear bevel is 3 to 1. The gear shafts are all mounted on annular ball bearings and the entire mechanism is very rigid in construction, the gears having ample widths.

At the rear of the central cross frame member, a yoke which supports in a pivot bearing the forward end of the propellor shaft housing, is attached, the ends of the yoke arms being pivotally mounted on pins through eye pieces attached to the frame so that the rear axle can have all freedom for up and down motion due to the spring action. The axle can also shift one wheel higher than the other, as the propeller shaft housing is revolubly mounted at its forward end in the yoke, thus giving the combination a universal action. The forward end of the propeller shaft itself is squared to take one-half of the universal joint which is placed between it and the rear of the change speed gears

The rear springs are three-quarter elliptics, shackled at their forward ends to special steel castings riveted to the side frame members. The front springs are of the usual semi-elliptic pattern, fastened at the forward ends to spring eyes in the horns of the frame, special cast steel fittings forming the ends of the side frame members.

BRAKES.

Two sets of brakes are supplied, the emergency brake being a contracting thermoid faced steel band, acting on a drum at the rear of the transmission. This is controlled by a hand lever operating in a quadrant on the right side of the car. It operates a short cross shaft by means of a crank and rod and the motion of this shaft operates a cam which draws the ends of the contracting bands powerfully together, thus gripping the steel drum. The foot brakes are of expanding thermoid faced type and also act against steel drums 2½-in. face by 10-in. dia. bolted to the rear wheels. The left pedal controls the clutch alone.

The steering gear employed, is Brown & Lipe's No. 3, mounted on the side member of the main frame and strongly braced to the sub-frame. The steering post has an angle to the horizontal of about 40 degrees, and its outside brass tube is fitted with a plate which is bolted through the laminated mahogany dash. The cross link of the steering rods is slightly curved to act as a spring to relieve the steering mechanism of severe road shocks and is placed at the rear of the front axle out of the way of road obstructions. The drag link is fitted at its ends with ball and socket shock relieving joints, passes above the axle and connects to a curved steering arm, which is high enough above the road to be clear of obstructions.

THE FRAME.

The frame following the most approved practice is of channel section pressed steel from 6-32-in. stock having 1½-in. flanges and 4½-in. greatest depth. The frame width is 33-in. narrowing to 26-in. at the front. A substantial sub-frame also of channel section pressed steel made from 3-16-in. stock has its side members mounted on special manganese bronze brackets riveted to the front and middle cross frame members.

The fenders are of the shield pattern webbed to the frame and made of steel and are well supported on T brackets the ends of which are mounted in tapered sockets riveted to the frame. The running boards are linoleum covered, brass edged and supported on pressed steel hangers.

Gasoline, 14 gallons of which can be carried, is provided for by a galvanized iron tank under the front seat flowing to the carburetor by gravity, the inside of the tank is provided with splash plates to prevent the gasoline from getting into violent motion, and at the outlet of the tank a special straining device in the form of a trap is provided. The carburetor is of a special float feed design which has proven satisfactory when used with this two-cycle engine.

BODIES.

All bodies are of aluminum sheets formed over hardwood reinforced frames and finished in hand buffed leather, the standard color being Hessian red, upholstery in black. A large carrying space is provided under the rear seat, and is made accessible by a liberal sized door in the rear seat heel board which does away with the necessity of lifting cushions, etc.

Hartford tires 32 by 3½-in. on standard clincher rims are supplied as regular equipment.

The rear axle housing is so constructed that its rear portion can be removed, making it possible to take out the entire differential without even getting under the body.

AIR COOLING.

Although this motor is of two-cycle type it is air cooled, and this is accomplished without any special difficulty according to the makers. A 1-16-in. dia. 6 bladed aluminum fan is riveted to a hub of McAdamite metal and is mounted on a circle of ¼-in. balls and belt driven from an aluminum pulley on the crank shaft, the belt used is a ¾-in. V. This fan is mounted on a ¾-in. stud from the forward cylinder and the outer end braced by a bracket. The speed ratio is three to one, the flywheel spokes also form a very effective fan.

These two-cycle cars are quiet running and are claimed to be exceptionally good hill climbers.

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"Millions for good roads—that is the slogan in the West and Middle West," says O. B. Henderson, sales manager of the Baker Motor Vehicle Co., who has just returned from a two months' tour of those sections. "The coast, especially, is going in for motoring stronger than ever.

"Why, one county alone, in California, has appropriated over a million dollars for improved roads. The cities are building boulevards. Seattle is spending a mint of money cutting down her hills. Improvement is going on everywhere.

"It's a prophecy wise dealers are heeding. Modern, substantial garages are being built in all auto centers. Foresighted business men are rushing to secure agencies in cities the good roads movement is opening up.

"Next year is going to be the biggest, by a wide margin, in the history of the trade.

"I find the demand for electrics growing by leaps and bounds. Years of steady growth have been followed by a sudden popular demand. I found electrics in many places where—a year ago—not one was in use."

The line of Jackson Gasoline Cars for 1909, made by the Jackson Automobile Co., Jackson, Mich., includes not only the regular models but also two entirely new cars; one Model H, a 4-cylinder touring car with full lamp equipment, 4-in. tires and magneto for $1,600, and the other Model K a light 2-cylinder opposed shaft driven touring car at $950. All models this year have elliptic springs, front and rear, and the manufacturers claim that more speed can be used over indifferent roads than with the half elliptic, and with less jolting for the car and passengers. Thermo syphon water circulation has been used in Jackson cars since 1906, and is continued in all models. All cars carrying the motor under the hood are built with I-beam axles in front, drop forged from a single piece. Brake rods are inside the frame, carrying out the idea of clean design. In the 4-cylinder models, with long wheelbase, the frames are drawn in in front, to permit closer turning on the front wheels. The 4-cylinder models are furnished either as touring cars or tourabouts and the tourabout body is built with a detachable 2-passenger tonneau.

THE 2-CYLINDER MODEL K

In brief, the specifications of the smaller of the two new cars Model K, which is shown in the title piece, are as follows: The motor is of the 2-cylinder horizontal type, 5-in. bore, 4-in. stroke, rated as 15-18 H. P., and is located transversely under the hood; the wearing parts such as cylinders, piston, piston rings, crank shaft, cam shaft, and valve stems, are ground; the motor is water cooled by the thermo syphon system; mechanical oiler; bevel gear

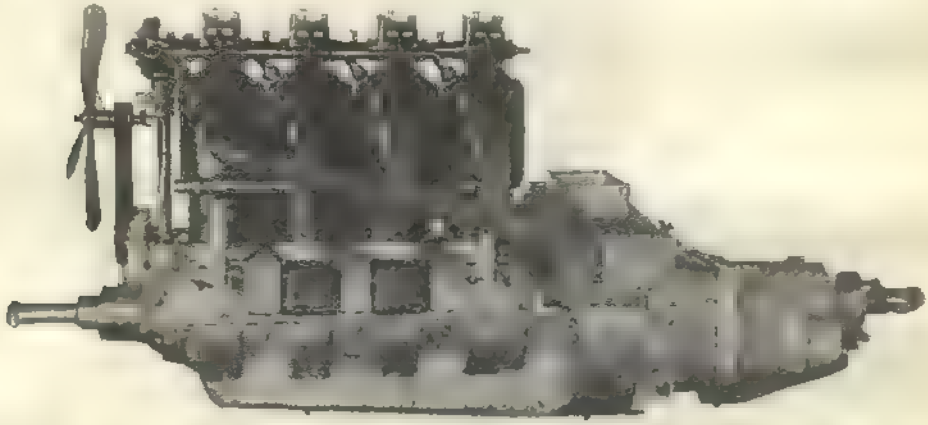

Fig. 1 Jackson Model E, 1909 motor. Cylinders cast separately, 4¾x4¾, 36-40 H. P., valves in the cylinder heads; overhead cam shaft driven by bevel gear from the crank shaft; all these moving parts being enclosed, this method of valve operation gives direct action without the use of push rods; motor and transmission constitute a unit power plant, with an oil tight housing for the fly wheel and clutch, and transmission is of the selective sliding gear, three speed and reverse type with annular ball bearings of the separated ball type; multiple disc clutch.

to eliminate, so far as possible, all back pressure. The inclined position of the valves in the cylinder heads allow the direct conduct of the charge without pockets or corners. The cylinders are ground to a finish, as are all the wearing parts of the type, provision being made for both thrust and radial load. The brakes are internal and external, with double brake drums on the rear wheels. The drums have ample air space between them to insure cooling under long application. All brake connec-

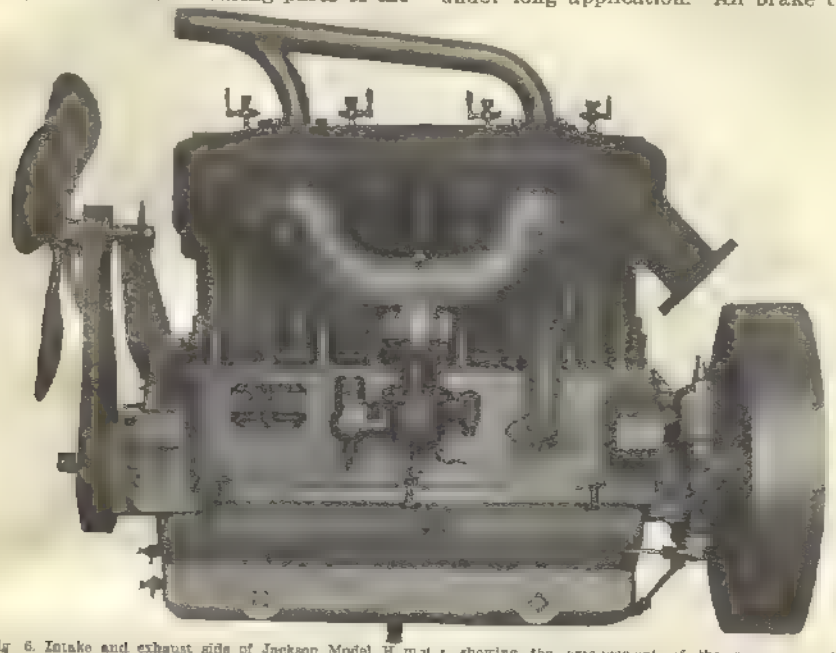

Fig. 6. Intake and exhaust side of Jackson Model H motor showing the arrangement of the piping, crank case breather and tube for pouring oil into the self contained oiling system the lower portion of the case acting as a tank, the oil being forced from there by a special pump at the lower end of a vertical shaft just in front of the fly wheel as shown.

motor. This process is carried out with the cam shaft, cams, piston pins, crank shaft, piston rings, pistons, and valve stems. There are five crank shaft bearings.

FLEXIBLE POWER PLANT MOUNTING

As last year, the unit power plant is used, clutch and fly wheel being enclosed The plant is supported on either side of the fly wheel case, and flexibly in front of the crank case and back of the transmission. The purpose of the design is to provide a suspension that will not transmit torsional strains from the frame. In accomplishing this, the points of suspension have been kept close enough together to prevent vibration. The clutch is multiple disc, with five discs, of 12-in. diameter. The spring pressure on the clutch is increased by the leverage of a system of toggles, and the arrangement makes an easy and positive action. The transmission is selective sliding gear, with annular ball bearings of the separated ball type. Lubrication is by the circulating oil system from reservoir in motor base. The equipment includes Splitdorf magneto, with an alternate battery system. Water circulation is by the thermo syphon system as in previous models. Tires are 34x4.

The rear axle is roller bearing, with ball thrust bearings on either side of the differential. The driving pinion is also supported by ball bearings of the separated ball

tions are inside the frame. The steering gear is the combination of the worm and nut and the rack and pinion types The nut covers the entire length of the worm, distributing the wear over the whole surface. On one side of the nut there is a

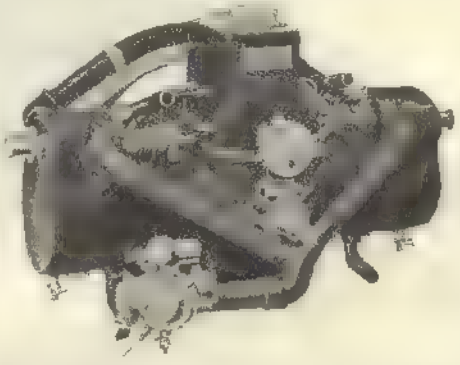

Fig. 7. The 1909 15-18 H. P. motor of Model K, cylinders 4x4 piston displacement, 157 cubic inches; all working parts finished by grinding thermo syphon cooling, mechanical oiler, bevel gear driven from cam shaft

rack, which engages the pinion on the steering arm. This design is adopted with a view to eliminating non-adjustable backlash. The gear is provided with adjustable ball thrust bearings at top and bottom. Motor control is by the conventional levers over steering wheel, with foot accelerator.

front can be had or 60-in. tread instead of the standard 56-in.

The tonneau is detachable, and the car is sold as a runabout for $850. The propeller shaft has two universal joints and a

The Model "E" touring car at $2,000 shows many refinements in detail, but retains the overhead cam shaft and valves inclined in cylinder heads. The cam shaft is supported by eight bearings, two over

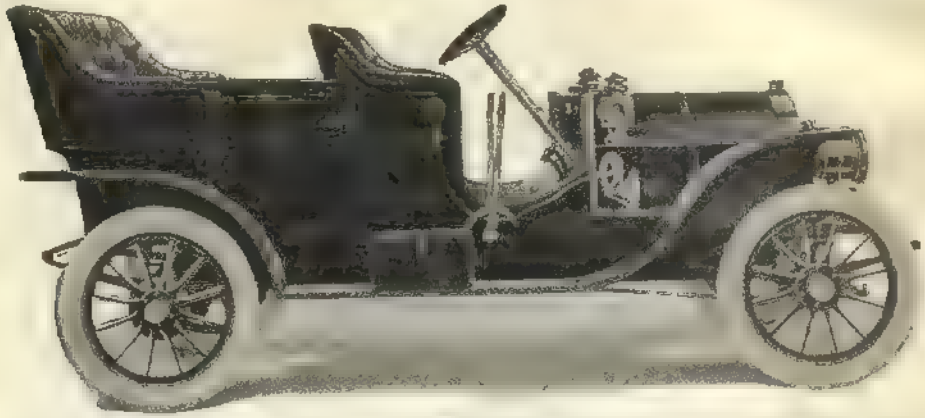

Fig 4. The new 1909 Model H Jackson at $1,600. Motor, [illegible] H. P. selective sliding gear speeds and reverse mounted on [illegible] wheels 1 1/2 inch wheel base. [illegible] capacity, tires, 32x4; same equipment Model E. Detachable tonneau or turtle deck $15 extra. On the same chassis at the same price, $1600 with detachable tonneau the Model H Roadster body is fitted.

separate torsion rod is provided. The rear axle is roller bearing at the ends, with ball bearings on either side of the differential. These are adjustable. The driving pinion is also ball bearing

each cylinder. The cams work in an oil bath between the bearings. The strain is thus applied to the cam shaft between supported points less than 3 ins. apart. The rocker arms are short and are pro-

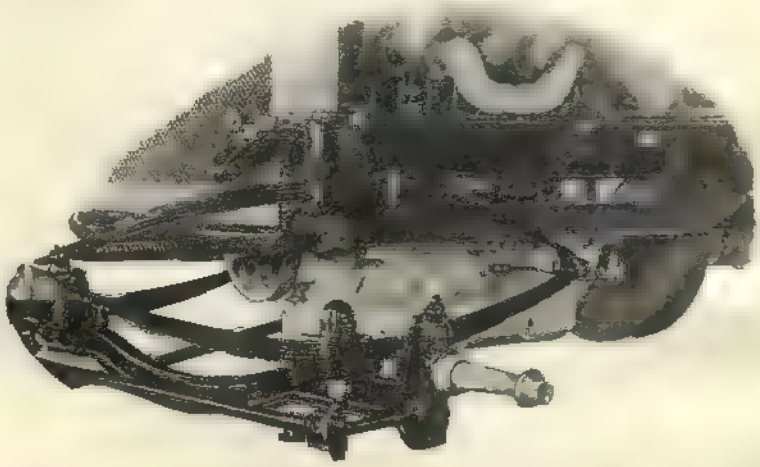

Fig. 5. Front axle and full-elliptic springs of Model H $1600 car. Full elliptic springs are used both front and rear. The special clip at the upper side which takes in the extension of the frame sill is shown, making a very substantial construction.

The Model C at $1,250 is continued with no change in the power plant. The motor is 2-cylinder opposed, under the body, 5¼-in. bore and 5-in. stroke. The valves are in the cylinder heads, and the push rods on the upper side. The cylinders, pistons, crank shaft, cam shaft and valve stems are ground. Ignition is by jump spark from storage battery and dry cells. The car is chain driven and the wheels are 32x3½, front and rear. The wheel base has been lengthened to 104 ins.

vided with large rollers upon which the cams operate. They are adjustable. To complete the provision against wear in the timing system, the rocker arms are made with double bronze to steel bearings, each with over four and a half square inches of wearing surface. The bevel gears are provided with adjustments, and back lash can be taken out to a nicety.

The intake pipe is of the fan type, with direct draft from each cylinder. The exhaust pipe is of ample diameter, designed

THE NEW MODEL H.

A new Jackson this year is the Model H at $1,600. This is a 4-cylinder touring car with 110-in. wheel base, 4-in. tires and magneto. It has a 4½x4½ motor, with 30 rated H. P. The standard rating for a motor of this size is somewhat larger. The motor is of the conventional valve in the side type, cylinders cast in pairs, with three bearing crank shaft. The motor is finished throughout by grinding, cylinders pistons, piston rings, crank shaft, cam shaft gears and bearings the same as in the $2,000 model. The same multiple disc clutch is used. The steering gear and magneto are the same as in the larger model, and a foot accelerator is provided. The front axle is I-beam, drop forged from a single piece. The back axle is provided with roller bearings next the wheels, and ball bearings on either side of differential. These are designed to take both thrust and radial load, and can be adjusted without removing axle from car. The driving pinion is also ball bearing. The propeller shaft has two universal joints, and separate torsion rod. The wheels are 32x4, front and rear.

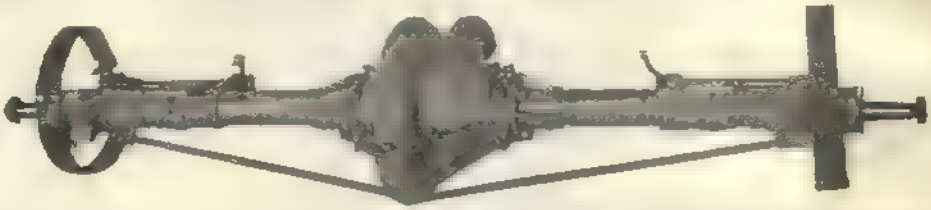

Fig. 8. Rear axle of the 1909 Jackson Model K, showing the removable cap over the differential and the arrangement of the internal expanding brakes, also the torsion rod.

## NEW DETROIT CO. TO BUILD RUNABOUTS

The Hudson Motor Car Company, of Detroit, Michigan, was admitted to membership in the Licensed Association. This is a new company, organized for the purpose of producing a moderate priced runabout.

The new car has a four-cylinder engine and will sell for less than $1000, and be produced in large quantities. Deliveries will commence during the 1909 season. The factory of the company is that formerly occupied in Detroit by the Northern Motor Car Co.

J. L. Hudson (from whom the car takes its name), a prominent capitalist of Detroit, is the president of the company. R. B. Jackson, formerly factory manager of the Olds Motor Works and more recently general manager of the E. R. Thomas Motor Company, of Buffalo, is general manager and treasurer. George W. Dunham, who has resigned as chief engineer of the Olds Motor Works to take the position, is chief engineer of the new company.

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Henry Bausch, of the Bausch & Lomb Optical Company, died recently in Augusta, Ga., where he had been since the latter part of January for his health.

New factory of the Economy Motor Buggy Co., of Joliet, Illinois. This concern was formerly at Fort Wayne, Ind. Joliet [illegible] of the heart [illegible] affords unparalleled advantages as a distributing center. The company manufactures Economy motor buggy vehicles and is [illegible] well known in the manufacturing and business world generally. In the past this company has been [illegible] exclusively the single seat pleasure type of vehicle, but has recently added a full line of [illegible] business wagons on which it is already booking orders very rapidly, necessitating the employment of several hundred skilled workmen, and making the Economy Motor Buggy Company one of the busiest factories in Joliet.

# CELEBRATION GOODS

## For Carnivals, Street Fairs, Souvenirs, Etc.

**We are Celebration Goods headquarters for America.** Everything good, whether new or staple, is shown on these pages When you see a standard seller here at a lower price than you ever heard of before, remember that buying in big quantities for four large houses makes that price possible. Send us your order this season, and we guarantee you'll buy of us hereafter.

### CONFETTI.

...ation necessity as well as luxury. Also extensively used for weddings, etc.

K1029 Bulk Assorted confetti (assorted) 50 lbs. in sack. Per lb. 6½c

K1030—Colored confetti in all bits and strips, of fine tissue paper, full 12½ lbs. in box. 60 bags to box Per 100 bags, $1.10

K1032, Rainbow Confetti—Mammoth 4½ lb. assortment packed of all bits and strips bright colored tissue paper. 2 oz. bag in box Per doz. bags 33c

**"Good Luck" Tube Confetti.**

Solid tinsel and gives you unlimited results. You can't afford to quit confetti from your order list

K1031 ... Assorted 2½ oz. bags, colored confetti filled with "Good Luck" tubes in carton Per 100 tubes $1.80

### SERPENTINES.

Thrown from different points make perfect spider web of brightly colored streamers in which the crowd is enmeshed. Lots of fun and ...

K1033 ... assorted colors, with ... Per 100 25c

### CARNIVAL DUSTER.

K1340—14 in. bamboo handle with ... Per doz. $1.15 Per Gro. $13.75 Doz. 16c

### LACQUERED TIN COW BELL.

K8070 4½x5x3½ in. brass, steel tin lacquered in ... stamped handle, clapper inside A noisy one Doz. 37c

### CARNIVAL SLAPPER.

Makes lots of noise without doing any damage

K1066—Highly colored, with white and blue ... handle, ... fringed end. Very top value for the price Per doz. $3.60 Per dozen 27c

### PAPER HORNS.

L2510 Paper covered tongue ... with wood mouthpiece, brass reed. American solid glazed paper covered. 14 in. long Gro. 89c

L2511 Wood mouthpiece, brass reed, American colors, glazed paper covered, length 14 in. ... Doz. 13c

### IMPORTED PASTEBOARD HORNS.

*Big ones for little money.*

Tapering shape, red, white and blue striped body, white stars on blue ground, flag paper on heavy pasteboard mouth piece, wood ... reeds. Each in box

| | |
|---|---|
| K5105—14½ in. | Doz. 21c |
| K5106 16½ " | " 30c |
| K5107—20½ " | " 35c |
| K5108—27½ " | " 41c |

### TIN HORNS.

All with white wood mouth piece and reed. Lithographed, gaudies French tone. Each warranted to blow.

Plain—

| | |
|---|---|
| K82, 12½ in. 1 doz. in box. | Doz. 26c |
| K84 15 " 1 " " | " 32c |
| K90 22 " ½ " " | " 72c |

Colored—

| | |
|---|---|
| K85, 12½ in. 1 doz. in box. | Doz. 32c |
| K86, 12 in. | Doz. 35c |
| K104, 14 " | " 45c |

Red, White and Blue—Wood mouth piece and reed. 1 doz. in box

K826, Cow Bell Horn—Both horn and bell tin, wood mouthpiece, assorted colors, made of sanded colored paper on heavy pasteboard, ... dozen in box, each wrapped. Doz. 78c

### TOY PASTEBOARD HORNS.

Best and most ... models that can be ... A toy ... when you want a number. Fast sellers ... prices pay good profit.

K5113, Auto Horn—Nickeled ... horn ... to sound ... bulb ... 3 reed pasteboard ... Doz. 30c

K5114, Whirlwind Horn—Red and blue ... 5½ in. nickeled ... whirlwind whistle end ... Doz. 36c

K585, Canary Bird Horn—7½ in. pasteboard cone, red white & blue striped paper covered, no mouthpiece, bulb and reed ... warbles exactly like a bird ... Doz. 39c

K586, Canary Bird Horn—14½ in. ... Not wrapped in 1-3 ... 1 doz. in box. Doz. 78c

K 6056 "Brandy"—9½ in. cone, white and blue striped paper glazed paper covered cone, flexible mouthpiece, wood reed, attractive lacel ... 1 doz. in box ... Doz. 39c

K6057—14 in. cone, otherwise as above. 1 doz. in box Doz. 84c

K560, "Automobile"—Red, white and blue striped paper cone, picture ... heavy pasteboard ... 9½ in. tall like regular auto horn. 1 doz. in box. Doz. 42c

K 6055 14 in. cone, otherwise as above. 1 doz. in box. Doz. 89c

K5544, "Owl"—Consists of "Bowling" with 8½ in. red, white and blue striped pasteboard. 1 doz. in box. Doz. 79c

K6054—9 in. cone, otherwise as above, novelty the harvest devilins on the harness. 1 doz. in box. Doz. 80c

### BOYS' FOLDING JOCKEY CAP.

L1200, Jockey Cap—Assorted boys' sizes, folding plaited design, striped ... panels, red, white and blue stripes, 9½ in. visor with ... Doz. 15c

### CARNIVAL RATTLES.

*Popular noise maker that pays you a good profit*

K 1041, Barrel Carnival Rattle 8x14 in. ... Solid wood, stained ... 1 doz. in box Per dozen 39c

K1042 ... same as ... Per dozen. 84c

K1044, B. Z. Fry Pan Rattle—... stamped steel fry pan blade, ... nickel plated handle, 6 paper inside and out. Very ... 4 doz. in box Per dozen 92c

K5041, Rooter—Extra heavy ... diamond tin, polished, turning of crank produces ... Lin ... 1 doz. in box Per ... 75c

### SCENTED JOSS STICKS.

L1 ... 18 sticks ... Each effect ... Per case of 250 ... Doz. boxes ... 72c

### WONDER "SPARKLER" OFFERING.

*Very beautiful and perfectly harmless. Can be used in the parlor, shooting in shape of ignition. Nipped selling and most popular novelty of the year. Send 2c extra for ...*

K8536 5c Box—For the ... 5c ... Each effect ... Per case of ... Doz. boxes ... 45c

K799 10c Sunwheel ... long glass sunwheel ... end which ... Per doz. boxes 70c Gro. boxes $8.00

### SERVICE STRIPES.

K1 ... Per doz. 15c

### "BEST EVER" JOKE CIGARS.

**No Danger. Very Laughable.**

*Here are the goods that sell ... Absolutely harmless. Each guaranteed to work.*

K56, Puritan Leader Cabinets ... wrapper and binder. Filler contains 2 tablets that burn like red light, one near lighting end and one near center. If wisely kept ... smoking after first surprise, begets a double ... Genuine ... Per box, packed 75c

K57, Cigarette Bouquets—Fine wrapper and binder. Seed filler containing spring tied at end, that ... fail like when tying is burnt. No ... Per box 85c

K55—Perfects shape and size, every appearance of genuine, ejects spray of stars with whistling sound, and smoke does not ... Per box 95c

# CELEBRATION GOODS

**For Carnivals, Street Fairs, Souvenirs, Etc.**

## CANES FOR ALL OCCASIONS

Here we list a whirlwind line of big selling, popular priced canes. Not everything, but goods that will sell in one shin. Note particularly the variety of 5 and 10 cent sellers.

Every carnival, picnic or fair furnishes an occasion for selling canes. Don't be sure profits slip away. All come 1 doz. in pair.

### BAMBOO CANES.

K1475—Fine natural bamboo stick, ..... Doz. 15c

K1479—Bamboo natural root bark, good weight, metal ferrule ..... Doz. 35c

### FULL LENGTH MAPLE STICKS.

Finished in plain color.

K1481—Heads metal wood carvings, assorted colors ..... Doz. 23c

K1482—Red enameled wood, ball top. Doz. 26c

K1483—Assted. ebony heads 4 kinds.. Doz. 36c

Highly finished in assorted colors, metal ferrules.

K1484—Metal dog head ..... Doz. 32c

K1485—Assted shapes wood carvings finished in assorted colors ..... Doz. 39c

K1486—Silver finished metal heads, claw ball and knobs, 4 styles assted. ..... Doz. 62c

K1487—Assted metal enamel heads, 7 kinds in ... and gilt finish ..... Doz. 67c

K1488—Assted vegetable ivory heads, plain and fancy turned and carved, assted colors ..... Doz. 70c

K1489 *Big value in center.* Assted. nickel heads, fox's head, engraved and enameled, woven knobs, 4 styles, silver and gilt finish ..... Per dozen **75c**

K1490 Assted. ... heads, legs, hoof and claws, 4 styles silver and gilt finish. Doz. 77c

K1491—Assted metal heads, 4 kinds, elephant, animal, negro, negro and baseball enamel finish in red, purple, blue, green ..... Doz. 85c

K 1492 Assted. metal crooks, 4 styles, engraved patent heads, Prince of Wales and negro's head, silver finish ..... Doz. 95c

K1493 Assted. large heads, 6 handy designs, some head medallion, ... and ... finish..Doz. $1.25

### JAPANESE CANE.

K1480 Japanese ... wood canes, 5-piece bamboo stick, full length. Price of ... this week, highly polished ... and ... Each 50c. Per dozen $5.50 ..... Doz. 32c

### LOADED HEAD CANE.

K1499 Steel, ... ball head, open crook. Large cane ... stick, black finish. ... ferrule. ..... Doz 75c

### FRATERNITY CANES.

Nickeled metal heads, with raised emblems on top, assted. color sticks.

K1513—Elks ..... Doz. 85c
K1516—Masons ..... " 85c
K1517—K. of P. ..... " 85c
K1518—Odd Fellows ..... " 85c
K1519 Woodmen ..... " 85c

### WALKING CANES.

K1494—Congo canes, prince of Wales crook, fancy ... Doz. $1.75

K1495—As above, extra heavy sticks. Doz. $2.15

K1496—Large engraved metal crooks, metal shapes, silver finished, medium stick. Doz. $2.00

K1497 -Hickory canes, extra heavy, crooked handles, ... finish, extra quality ..... Doz. $3.25

K1498—Hickory canes as above ... Doz. $4.50

### HIGH GRADE WALKING CANES.

All with nickel plated double steel ferrules.

K490—Chesterfield. Partridge wood, dark brown ... varnished and polished, sterling silver cap, good walking weight. Do ... Each 72c

K491—Beau Monde. ... wood, dark brown mottled finish, highly polished, large sterling silver cap. Very best wt. ... Each 95c

K492—Beau Brummel. Partridge wood, best quality, ... highly varnished and piano polished, fancy sterling silver cap. ... Each, $1.25

K493 - Boulevard. Partridge wood, best selected handsome ... mottled effect ... finish, piano polished, ... sterling silver cap. ..... Each, $1.40

### CANE ASSORTMENTS.

Carefully selected assortments, including wood metal and loaded canes, complete with 48 fish twine rack and 50 polished cane rings.

K1525—Asst. of 100 canes....Complete, $ 5.00
K1526— " " 200 " " 10.00
K1527— " " 300 " " 15.00
K1528, Cane Rack -426, ... fish twine ... canes ... Each 50c

### CANE RING.

K1529, Cane Rings - 1¼ in. inside diam., well finished hardwood ..... Per 100, 50c

### GLASS WIND CHIMES.

*Splendid popular priced novelties.*

To be hung where ... blows in ... A pleasing melody.

L5364—7 in. pa... tube, ... ring, suspending ... one decorated glass. ... adorns in harmonious tones. Each 45c

Per dozen ..... Doz. 45c

L 5 3 6 4 — As L5365, but with 14 pcs of glass. Each in box. Per dozen ..... Doz. 95c

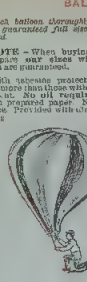
L4917 As L5363, but with 2 paper covered wire rings, and 18 pcs. of glass, set in box, 24 ... boxes in ... Per dozen ..... Doz. **$1.75**

### IMPROVED "RED, WHITE AND BLUE" COLORED PAPER BALLOONS.

*Each balloon thoroughly inspected and guaranteed full size as every sealed.*

NOTE — When buying balloons compare our sizes with others. Ours are guaranteed.

With extensive ... worth 50% more than those without. Ready to blow ... No oil required. Made from prepared paper. Not easy to ... Provided with directions for ...



K953—H. 30 in. ... in box. Per dozen. 55c

K954—H. 39 in. ... in box. Per dozen. 2.25

K955—H. 48 in. ... in box. Per dozen. 2.50

K956—H. 63 in. ... in box. Per dozen. 3.00

K957 H. 75 in. ... doz. in box. Per dozen. 3.50

K958—H. 90 in. ... doz. in box. Per dozen. 2.75

K959—H. 108 in. ... doz. in box. Per dozen. 3.25

K960 H. 96 in. ... doz in box. Per dozen. 4.00

K961—H. 144 in. ... doz. in box. Per dozen. 4.95

NOTE -All our balloons are packed in boxes and reach you in good order.

### —NEW— —NEW BILLY 'POSSUM BALLOON.

Billy 'Possum is the prettiest day craze and there will be no limit to the sale of these 5¢ ... Regular 50c size and quality, ... real value at this price, but we offer it as a 10 cent ... as proof of LITTLE ADVERTISERS' fine future buying power. Do not fail to include this excellent bargain in your order.

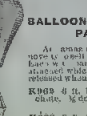
K8838—H. 4 ft., ... 87 in., high ... pleasing ... ... Each 10c

K965 -34 in. long ..... Doz. $2.00
K966 -8 ..... 3.95
K967 11 " " ..... Each, 72c

### AIR SHIPS.

A ... cent ... and will ... ter ... than ... ... shape wand has little effect upon them. Each in box

### BALLOONS WITH PARACHUTES.



K968 4 ft. high, 18 in. ... globe, ¼ doz. in box ..... Doz $2.10

K963 6 ft. high, 24 in. ... globe. 1 in box ..... Doz $4.20

K964 -10 ... ft. high, 30 in. ... globe. 1 in box ..... Each, 75c

### ROUND CUT PAPER CAPS.

*Extra strength, full count, every cap guaranteed.* Lid boxes in carton.

K796 — 50 s, regulars full count, ... per box. Per carton ..... **18c**

K796 15s, Mammoth, extra ... in box. Per carton ..... **36c**

K797 — 50s, Mammoth, ... size all in box. Per carton. ..... **65c**

### PAPER CAP PISTOLS.

Best and most complete line ever sold by any ... The cream of the market's offerings.

K975 ... with ... ... ...

# CELEBRATION GOODS

For Carnivals, Street Fairs, Souvenirs, etc.

### U. S. MUSLIN FLAGS.

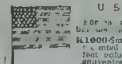
Printed Muslin Flags. Fine assortment of printed flags in [illegible]

| | | | |
|---|---|---|---|
| K1 | 3 x 5 in. | | $ 1c |
| K5 | 4 x 6 in. | | |
| K7 | 5 x 8 in. | | |
| K8 | 7½x12 in. | | 4c |
| K9 | 10 x 18 in. | | 8c |
| K9½ | 11 x 19 in. | | 11c |
| K9 | 12 x 18 in. | | 14c |
| K7 | 18 x 15 in. | Doz. | 85c |
| K8 | 24 x 14 in. | " | 90c |
| K9 | 24 x 24 in. | " | $1.35 |
| K10 | 36 x 18 in. | " | 1.45 |
| K11 | 36 x 36 in. | " | 2.70 |
| K12 | 48 x 36 in. | " | 3.60 |
| K13 | 54 x 36 in. | " | 4.20 |
| K14 | 54 x 54 in. | " | 6.30 |

### PAPER U. S. FLAG.

K2486—Flag Paper [illegible] Gro. 25c

### U. S. PIN FLAG.



For [illegible] Gro. 60c

K1000—Small, crimped paper [illegible] mounted on pin pins, for [illegible] Excellent for souvenirs. Gro. [illegible] 39c

### JAP SILK U. S. FLAGS ON STICKS.

L53—Size 2 inches. Japanese silk mounted stick, gilt ball top. Each in box. Gro. 60c

L56—Size 3½x5, fine Jap silk hemmed edges, mounted on fine stained stick. 2 doz. in pkg. [illegible] Doz. 21c

L57—Same as otherwise as above. 1 doz. in pkg. Doz. 35c

### PRINTED COTTON BUNTING FLAGS ON SPEAR HEAD STAFFS.

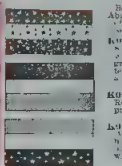
Fast [illegible] Each flag [illegible] Per dozen [illegible]

| | | |
|---|---|---|
| K1036 | 4x12in. | $0.39 |
| K1037 | 12x18" | .58 |
| K1038 | 18x24" | .97 |
| K1039 | [illegible] | 1 75 |

### TOY FLAG FESTOONING.

K6023—[illegible] Doz. 36c

### "BELLMERE" DECORATING BUNTING.



Best selling patterns. Above 24 in. wide [illegible] Yard [illegible]

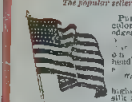
K1010—Stars and Stripes—[illegible] Yard 3½c

K1011, "Tri-Color"—Red, white and blue parallel stripes. Yard 3½c

K1012, "Blue Star"—[illegible] Yard 3½c

### U. S. SILK FLAGS—Mounted.

*The popular sellers.*



Parasilk, fast color, hemmed ends, [illegible] on 6 in. gilt spear head. Black stick. Put [illegible] in a box. Each flag on the market.

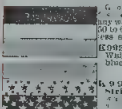
| | | |
|---|---|---|
| K805 | 2x3 in. | Per dozen, $0.26 |
| K806 | 4x6 " | .37 |
| K807 | 5x8 " | .54 |
| K808 | 6x10 " | 1.10 |
| K809 | 8x12 " | 1.35 |
| K810 | 10x15 " | 2.00 |
| K811 | 12x18 " | 2.80 |
| K812 | 14x21 " | 3.75 |

Extra large [illegible]

| | | |
|---|---|---|
| K814 | 6x10 in. | $0.95 |
| K815 | 8x12 " | 1.55 |
| K816 | 10x15 " | 2.10 |
| K817 | 12x18 " | 3.10 |

### "FAST COLOR" GOVERNMENT BUNTING.

The high grade [illegible] Will give satisfaction under any conditions.



6 [illegible] Yard [illegible] Any weather 24 in. wide 50 to 60 yds. in piece no less sold

K1093, "Tri-Color"—White, red, white and blue parallel stripes. Yard 4½c

K1094, "Stars and Stripes"—[illegible] Yard 4½c

K1095, "Blue Stripe"—Parallel red, white and blue stripes, blue stripe thicker dotted with white stars. Yard 4½c

### COTTON BUNTING FLAGS

[illegible] and proof on [illegible] fast [illegible]

| | | |
|---|---|---|
| No. 6 | 6x12 in. | $0 55 |
| | [illegible] | 90 |
| | [illegible] | 1 80 |

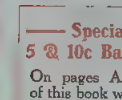
### STANDARD U. S. WOOL BUNTING FLAG.

*The finest finish and workmanship of any flag made. Nothing better can be produced.*

[illegible] Wool Bunting [illegible]

| | | |
|---|---|---|
| [illegible] | | Each $0 58 |
| [illegible] | | 1 47 |
| [illegible] | | 1 96 |
| [illegible] | | 2 45 |
| [illegible] | | 3 20 |
| [illegible] | | 4 15 |
| [illegible] | | 5 70 |
| [illegible] | | 7 65 |
| [illegible] | | 10 25 |
| [illegible] | | 11 30 |
| [illegible] | | 15 30 |

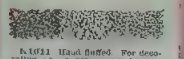
### NATIONAL NETTING.



K1001 [illegible] Each in pkg. Each 3½c

### MOSS PAPER FESTOONING.

*Can be used to advantage in your store decoration.*

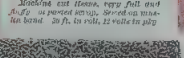


K1011 Hand finished. For decorating [illegible] Per roll [illegible] Doz. rolls. 4c

K1019—Green, otherwise as K1011. Per doz. rolls, 84c

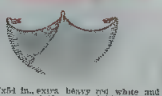
### FIREPROOF FESTOONING.

*Looking cut flowers, very full and fluffy in paper strip. Sold in manilla band. 30 ft. in roll, 12 rolls in pkg.*



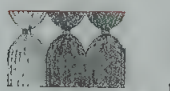
| | | |
|---|---|---|
| K1013 | Red. Per doz. rolls. | $1.20 |
| K1014 | White " | 1.20 |
| K1015 | Blue " | 1.20 |
| K1016 | [illegible] | 1.20 |

### FESTOONS.



K30—27x54 in., extra heavy red, white and blue honeycomb tissue, not the flimsy kind. For [illegible] 1 doz. in box. Doz. 67c

### RED, WHITE & BLUE TASSEL FESTOONING.



K1007 [illegible] Each 28c

K1008—As K1007, gold green. Each 28c

### MUSLIN NATION SETS.

Each string holding 50 Flags of all Nations as colors will not fade nor be damaged

K1034 Flags 6x10 12 on string. String 37c

K1035— " 12x18 12 " " 86c

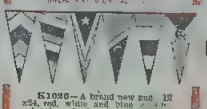
### FLAG FANS.

K996 20 in white, 10 in [illegible] on [illegible] paper. A unique and attractive decoration for [illegible] decoration. Folds flat when not in use. Doz. 33c

K997 [illegible] Doz. 69c

### PENNANT SET

[illegible]



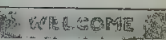
K1036—A braid new one, 12 x24, red, white and blue printed on both sides in [illegible] designs, narrow shape 12 ft. on string. For attaching [illegible] Each set in pkg. 1 [illegible] set 38c

### "WELCOME" SIGNS.

K1002—6x24 in. wood, printed in gilt [illegible] with word "Welcome" in bright [illegible] Suitable for all occasions. 1 doz. in pkg., assd. colors—red, blue, purple, green, etc. Gro. $3.00, Doz. 27c

### "WELCOME" BANNER.

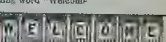
72 in. [illegible] Sells on sight.



K1005 [illegible] White and [illegible] with word "Welcome" in bright colors. Each in pkg. [illegible] Doz. $3.00, Ea. 27c

### MUSLIN BANNERS.

For inside or outside decoration. Heavy muslin printed with gilt and bright fast colors, consisting of 7 flags, each with letters forming word "Welcome."



K1003—Each flag 12x18 in. 7 on banner. Each 28c

K1004—Each flag 14x24 in. 7 on banner. Each 37c

### RED, WHITE AND BLUE HONEYCOMB NOVELTIES.

Best decoration goods made.

Bells—Best goods. Each with loop for hanging. Very close mesh perforations.

K807—Bell, 3½ in. 2 doz. in box. [illegible] Doz. 23c

K808—Bell, 5 in. 1 doz. in box. [illegible] Doz. 39c

K809—Bell, 6½ in. 1 doz. in box. [illegible] Doz. 75c

K811—Bell, 8½ in. 1 doz. in box. [illegible] Doz. 95c

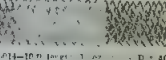
K8611—Bell, 11½ in. 1 doz. in box. [illegible] Doz. $1.95

Wreath and Bell—Very popular. Sells wherever shown. Folding [illegible] bell and wreath on loop of wire for [illegible] in box.

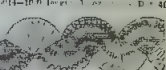
K5012—12 in. wreath. Doz. 42c

K5013—16 in. wreath. Doz. 87c

Festoons—Alternating red, white and blue, very attractive. [illegible]



K [illegible] 10 ft. long [illegible] Doz. 40c



K305—54 in fan effect, 8 pleats, spread, on heavy cord in three, not easily torn, and rings. 1 doz. in box. [illegible] Doz. 84c

### MOSS PAPER HORSEHEAD PLUME.

K1009 [illegible] Doz. 32c

### MOSS PAPER WREATH.

K1010—Large size, diam. 16 in. wire [illegible] combination of white and blue. 1 doz. in pkg. Doz. 32c

## Special
## 5 & 10c Bargains

On pages A to H of this book we offer a line of goods to retail at five and ten cents, every one of which comes to you at a special bargain price for July.

# CELEBRATION GOODS

**For Carnivals, Street Fairs, Souvenirs, Etc.**

## TRANSPARENT LANTERNS.

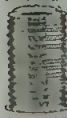
Bucket shape. Assd colors 25 in lot.

K1017 Diam 7½ in. Per 100, $1.50

K1018—Diam 9 in. Per 100, $2.25

## BUCKET SHAPED LANTERN.

L144B—8 x 6½. Collapsible, embossed top and base, wire hanger, fancy striped in assd bright colors, metal candle holder 2 doz in box. Doz 15c



## JAPANESE PAPER LANTERNS

**Open Stock.**

For decorating on all occasions, both in and out doors. Brilliant colorings in large variety and effects. Each size packed 24 in bale.

**Round.**

L1353 8x8
Per 100 $2.10
L1355—10x10
Per 100 $3.50
L1357 12x12
Per 100 $6.75

**Oblong.**

L1354
Per 100 $3.00
L1356 Medium
Per 100 $4.00
L1358—16x10
Per 100 $5.25

## FINE SILK "GIFU" LANTERNS.

Particularly ornamental and attractive made of beautiful Japanese fi

in delicate colors and gilt

Assd shapes.

89c

$2.25

## NEW NOVELTY LANTERN ASST.

Entirely new and attractive goods the best sellers when the lawn party Appropriated for any limited decora decoration complete without them, deserves a good profit for an

Each

Contains American E Gold Stars & Str Man in the Moon Globes to be hung ou the holder. 1 doz in box..... Doz. 35c

## Imported CARNIVAL LANTERNS.

Direct importation of these latest amusing European novelties bound to be big sellers. Will delight the children and make the grown

42c

K1031, "Celebrity" Assorted Well Known Statesmen and Religious Mother Goose, Father Goose, Characters and the Cop. Assorted Designs.

6 styles, brightly lithographed in 5 colors bodies about 8 in. wide by 10½ high in assorted positions. Assd. in box.

Doz 78c

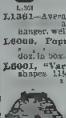
## JAP PAPER LANTERN ASSTS.

L324

L1361—Average 5x5, assid, shapes and sizes, cased in ranger, well made. 6 doz. in box. Doz. 18c

L6008, Popular Asst—Assd styles and sizes. 1 doz in box..... Doz. 38c

L6001, "Variety" Asst—Assd sizes and shapes, 11x27 to 18x30, floral designs. 2 doz in box..... Doz. 60c



L6002, Assd sizes and shapes, floral designs. 2 doz in box..... Doz. 79c

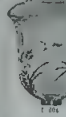
L6003, Assd sizes and shapes, floral designs. 2 doz in box..... Doz. 84c

L6004, Mikado—13x30, to 27x selection of sizes medium to fancy sha

35c

L6008, Tegu Asst—11x17 artistic stencils, floral decoration in attractive colors, gold bond edges, assd. styles. 1 doz in box

Doz $1.25



L6009, Mikado—13x30, to 27x selection of sizes, medium to fancy sha

$1.60

$2.00

## JAPANESE PARASOLS.

Open cloth, floral decoration on paper at tractive colors.

L1370—16in. spread, 3 doz. in box. Doz 18c
L1371 18 " " " " 25c
L1372—20 " " " " 32c

The following is better quality than above ure, gay paper and heavier ribs. Each in box

L1018—18in. spread

84c

84c

85c

$1.15

2.25

## TENT UMBRELLAS

L1376—42in. spread, assd handles

$0.50

60

1.25

1.75

2.75

## CHILDREN'S FANCY TISSUE PAPER PARASOL.

*All the rage with the little ones this season.*

L1351 assorted colors

## JAPANESE NOVELTY FANS.

**A SPLENDID VALUE.**

*A good money maker for you*

L1357 narrow folding floral and

ed grounds, gilded sized perfo

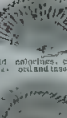
raised assid decorated top, assid color ings, decorated lacquered sticks, cord and tassel. 3 doz. in box, assid.

Per Dozen. **30c**

L1A5—6 in. narrow folding 3 gold raised floral decora tinted, perforated, raised dress paper top silver shavered ba decorated curved

45c

L1356—8½ in. narrow folding, floral and scenic decora



tom entirely ne

assid colorings, carved brown lacquered sticks and tassel. 1 doz. in box.....Doz. 84c

L1358—7½ in. sticks—each will

orted bla and tassel. 1 doz. in bo

89c

## JAPANESE SILK GEISHA FANS

quered wood handle, with silk tassel Assd shapes. 1d

35c

Floral and bird decorations in natural colors.

decorations, assid. 1 doz. in box

75c

Japan, and painted hand

Japan with two

with pan ilk brocades, fine black lacquer sticks, silk tassel and cord. 1 doz. in box, assid

Doz. $1.25

## NOVELTY TRICK FOLDING FANS.

L6368, Cigar Shape Paper Fan. Gilt

wrapped all size

2 doz. in box.

Doz 20c

## JAPANESE BOTTLE FAN.

1 doz in

35c

## JAPANESE PENNY TOYS.

Novel quick selling items which readily pay splendid profits.

L6246, Parasol—8 in spread, wood ribs, American paper, 7½ in handle. 1 gro. in box..... Gro 72c

L6247 Parasol—11¼ in A in handle. 1 gro. in box..... Gro 85c

L6381, Flags of all National Paper Hat—A size brill, assid shapes international colors with combination floral decorations ½ American, ½ assid nations 1 gro. in box..... Gro 78c

L1212—Paper Lantern assid shapes, bright stripes. 8x20, wire handle. 2 doz in box, gro. in box.... Gro 85c

L1161—Paper mache dolls 3½ in painted felt top hats, assid colors, crimped paper dress, with voice. 4 doz. box..... Gro 88c

## MISCELLANEOUS JAP TOYS AND NOVELTIES

L6370, Souvenir Post Cards. Heavy stock, tinted photos of Japanese landscapes, etc. 1 doz. assd in cartloge. ... ... Doz. 18c

L6362, Trembling Doz in box 2½ in

Asiatic bodies painted in and tentacles of finely colored suspended with threads

clutches rise or recede and contract in natural manner. 1 doz. in box.

32c

L5361, Woven Paper Snake Mat

Doz 39c

## NOVELTY MATCH CUPS

L5373—Assid faces painted in natural colors, various facial expressions, real hair, all made from rubber cups

33c

42c

89c

## JAPANESE ROUND FAN FIRE SCREENS.

Appropriate and p in almost any room of the house, especially near the fire corner or front of fireplace.

L6031—Diam 24 in., ht. 39, floral decorations, gold and silver border. Each, with folding removable lacquered wood handle. 4 patterns. Each complete in shi

Doz 39c

L6032—Diam 28 in., ht. 33, attractive design, otherwise as L6031

Doz 72c

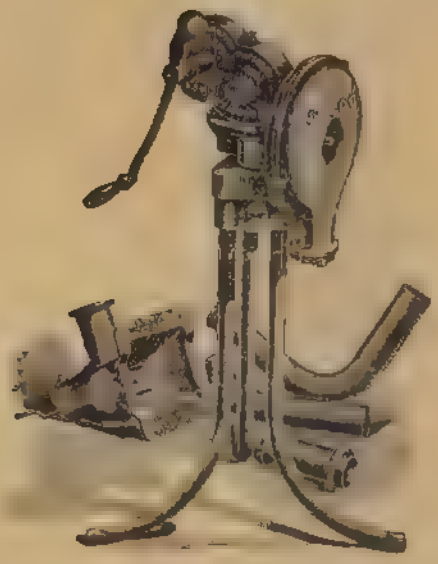
MARLIN RIFLES

A new line of highest quality guns.

SEE THE GUN PAGES

# Blacksmith Blowers

**CHAMPION**



**Ball Bearing**

**Patent Direct Drive, High Speed Spiral Gearing, with "Whirlwind" Blast Arch Cinder Tuyere Iron and Piping Complete. All Working Parts are made from the best Tool Steel and Phosphor Bronze, enclosed in an Oil-tight Casing.**

| No. | Diam. Fan. | Weight | Each |
|---|---|---|---|
| 400 | 12 in. | 150 lbs. | $37.00 |

**TROJAN**

**Cog Gearing**

All Cogs and Gearing are in an Oil tight Casing With Tuyere and Piping Complete

| No. | Diam. Fan. | Weight | Each |
|---|---|---|---|
| 500– | 12 in. | 100 lbs. | $25.00 |
| 500– | Without Tuyere. | | 24.00 |

The Blast is produced by turning the Crank in either direction

# Champion Steel Portable Forges

**Ball Bearing**

Adapted for Government use Street and Steam Rail Roads, Bridge and Tank Builders, Mines and Prospectors, Boiler Repairers, or any portable work requiring Compactness and Lightness with a strong Blast.

| No. | | Each |
|---|---|---|
| 401– | With Shield, Hearth 18 in. Diam. Fan 9 in. Height 30 in. Weight 90 lbs. | $35 00 |

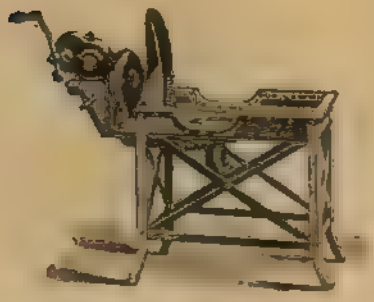
Adapted for Toolmakers, Jewelers, Bicycle Repairers, Tempering, Tank Builders, Miners, Prospectors, Repairing, on Boilers Steam and Street Railroads

| No. | | Each |
|---|---|---|
| 402– | With Half Hood Hearth 18 in. Diam. Fan 9 in. Height 30 in. Weight 90 lbs. | $38.00 |

# Champion Steel Portable Forges

The Champion Steel Forges are made from Structural Steel. The machinery is all enclosed in a tight Casing and Noiseless, no Belts or Friction, **Ball Bearings**; will produce Blast to weld 4 in. Iron in ten minutes, Crank can be turned either way

**Ball Bearing**



Practical for Government use, Race Horse Stables Steam Railroads, Bridge and Tank Builders, Boiler work of any kind, or for any use requiring a Hearth of this size.

| No. | | Each |
|---|---|---|
| **404**—With Shield, Hearth 24x24 in., Height 30 in., Fan 9 in. Diam., Weight 110 lbs ... ..... | | $45 00 |

Adapted for Toolmakers, Jewelers, Bicycle Repairers, Tempering Tools, Tank Builders, Miners, Prospectors, Repairs on Boilers, Steam Railroads or any inside or outside work desiring a Forge of this size with Half Hood

| No. | | Each |
|---|---|---|
| **405**—With Half Hood, Hearth 24x24 in., Height 30 in., Fan 9 in. Diam., Weight 120 lbs .. ... | | $49 00 |

**Note**—Price does not include water tank

Adapted for any kind of Horseshoers and General Blacksmiths work, including all Railroad work from the Lightest to the Heaviest With "Whirlwind" Blast Anti-Clinker Heavy Nest Tuyere Iron

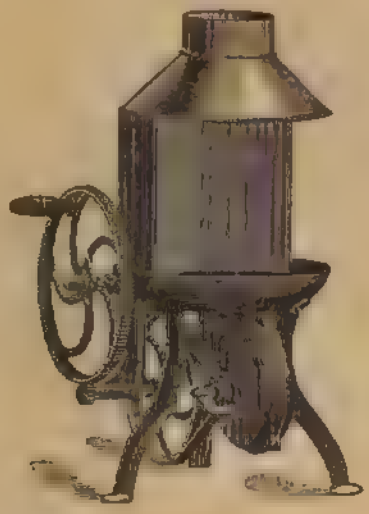
| No. | | Each |
|---|---|---|
| **408**—With Half Hood, Hearth 30x36 in., Fan 12 in. Diam., Height 30 in., Weight 225 lbs..... .. ... | | $65.00 |

**Note**—Price does not include water tank

# Portable Forges

## CUMBERLAND

No. 7

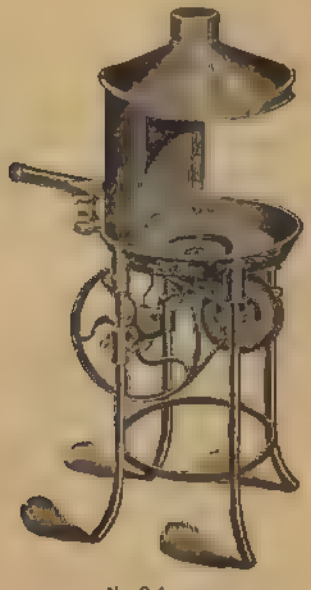


No. 8

Specially designed for Light Work for Miners, Prospectors and Farmers

| No. | Diam. Fan | Height | Diam. Bowl | Weight | Each |
|---|---|---|---|---|---|
| 7–With Shield | 8 in. | 15 in. to top of Bowl | 14 in. | 45 lbs. . . . . | $12.00 |
| 8–With Hood | 8 in. | 15 in. to top of Bowl | 14 in. | 50 lbs. . . . . | 15 00 |

## SUNSET



No. S 4

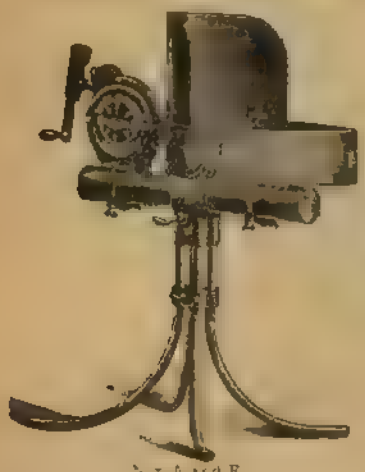
No. S 5

Specially designed for Farmers and for all kinds of Light Repair Work

| No. | Diam. Fan | Height | Diam. Hearth | Weight | Each |
|---|---|---|---|---|---|
| S 4–With Hood | 8 in. | 30 in. | 18 in. | 70 lbs. . . . . | $16.00 |
| S 5–With Shield | 8 in. | 30 in. | 18 in. | 65 lbs. . . . . | 14 00 |

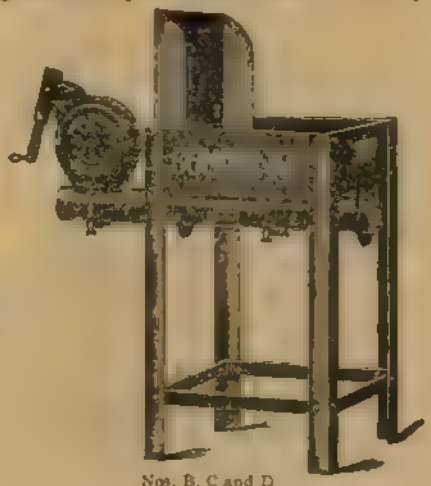
# Cumming Portable Forges

Strongest Blast, Easiest Running, Most Durable. Can be taken apart or put together complete in one minute easily



Nos. A and E

Cut showing A and E Taken Apart

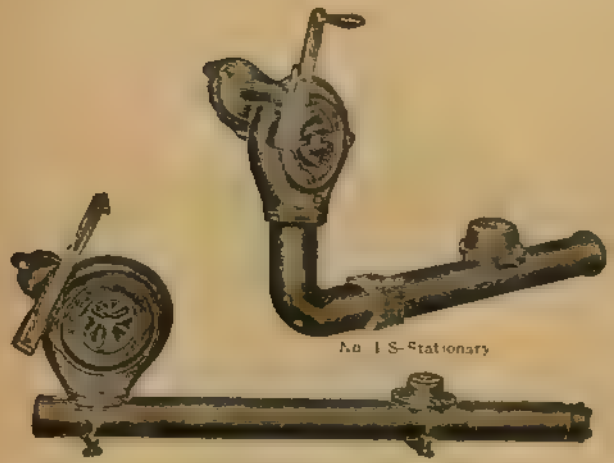


Nos. B, C and D

| No. | Diam. Fan | Hearth | Height | Weight | Each |
|---|---|---|---|---|---|
| A–Riveters | 7 in. | 18 in. Diam. | 30 in. | 90 lbs. | $ 70 00 |
| E–Miners | 9 in. | 24 in. Diam. | 30 in. | 180 lbs | 130 00 |
| B–Boiler Makers | 7 in. | 18 in. Square | 32 in. | 135 lbs | 80 00 |
| C–Machinists | 7 in. | 24 in. Square | 32 in. | 155 lbs. | 90 00 |
| D–Blacksmiths | 9 in. | 30 in. Square | 31 in. | 220 lbs. | 150.00 |

# Cumming Hand Blowers

Phosphor-Bronze Bearings; Mechanically perfect Easiest Running, and Most Durable



No. 1 S–Stationary

No. 2 S–Stationary

Nos. 1 P and 2 P Portable

| No. | Diam. Fan | | Each |
|---|---|---|---|
| 1 S–For Stationary Forge | 7 in. | Cast Iron Pipe and Tuyere, Wt. 77 lbs. | $ 65.00 |
| 2 S–For Stationary Forge | 9 in. | Wrt. Pipe 4 in. Diam. 5 ft. long, with Tuyere, Wt. 90 lbs | 100.00 |
| 1 P–Portable | 7 in. | Wrt. Pipe 3½ in., Diam. 2 ft. 8 in. long, Wt. 66 lbs. | 60 00 |
| 2 P–Portable | 9 in. | Wrt. Pipe 4 in., Diam. 3 ft. 9 in. long, Wt. 120 lbs. | 100 00 |
| 1 –Blower Only | 7 in. | (Without Pipe, Tuyere or Stand), Wt. 28 lbs. | 50 00 |
| 2 –Blower Only | 9 in. | (Without Pipe, Tuyere or Stand), Wt. 52 lbs. | 80 00 |

All Parts Interchangeable

# Clean Cut Polished Hatchets

Extra Quality Crucible Cast Steel, Full Polished and Etched
Fully Warranted

## SHINGLING

| No. | Cut | Per Doz. |
|---|---|---|
| 1 | P–3½ in. | $10.50 |
| 2 | P–3¼ in. | 11.00 |
| 3 | P–4¼ in. | 11.50 |

One-half Doz. in a Box

## CLAW

| No. | Cut | Per Doz. |
|---|---|---|
| 1 | P–3½ in. | $11 50 |
| 2 | P–3¾ in. | 12 00 |
| 3 | P–4¼ in. | 12.50 |

## HALF

| No. | Cut | Per Doz |
|---|---|---|
| 2 | P–3¼ in. | $11.50 |
| 3 | P–3⅞ in. | 12 00 |

## BROAD

| No. | Cut | Per Doz. |
|---|---|---|
| 1 | P–4 in. | $13 50 |
| 2 | P 4½ in. | 14.50 |
| 3 | P 5 in. | 17.00 |
| 4 | P 5½ in. | 18 50 |
| 5 | P–6 in. | 20 50 |

Single or Double Bevel, Always specify which is required

One-half Doz. in a Box

Clean Cut

# Clean Cut Special Hatchets

Extra Quality Crucible Cast Steel, Rustless "Gun Metal" Finish

Fully Warranted

## SHINGLING

| No. | Cut | Per Doz. |
|---|---|---|
| 1 | S–3½ in. | $ 9.00 |
| 2 | S–3⅞ in. | 9.50 |
| 3 | S–4⅜ in. | 10.00 |

One half Doz. in a Box

## CLAW

| No. | Cut | Per Doz. |
|---|---|---|
| 1 | S–3½ in. | $10.00 |
| 2 | S–3⅞ in. | 10.50 |
| 3 | S–4⅜ in. | 11.00 |

## HALF

| No. | Cut | Per Doz. |
|---|---|---|
| 1 | S–3⅛ in. | $ 9.50 |
| 2 | S–3½ in. | 10.00 |
| 3 | S–3⅞ in. | 10.50 |

One half Doz. in a Box

## BROAD

| No. | Cut | Per Doz. |
|---|---|---|
| 1 | S–4 in. | $12.00 |
| 2 | S–4½ in. | 13.00 |
| 3 | S–5 in. | 14.50 |
| 4 | S–5½ in. | 16.00 |
| 5 | S–6 in. | 18.00 |

Single or Double Bevel, Always specify which is required

One half Doz. in a Box

# Clean Cut Special Hatchets

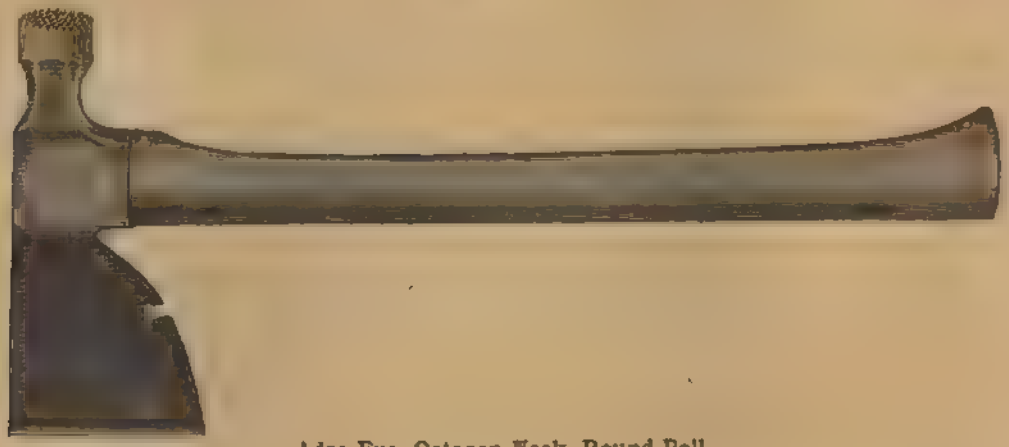
Extra Quality Crucible Cast Steel, Rustless "Gun Metal" Finish, Fully Warranted

## FLOORING

For laying floors and side walks. Extra heavy over the eye.

| No. | Cut | Per Doz. |
|---|---|---|
| 2S Flooring | 4½ in. | $13.00 |

## DERRICK



**Adze Eye, Octagon Neck, Round Poll**

Used by Oil Well Rig Builders

| No. | Cut | Handle | Weight | Per Doz. |
|---|---|---|---|---|
| 2– | 3½ in. | 18 in. | 2½ lbs. | $ 14.00 |

Clean Cut

# Clean Cut Special Hatchets

Extra Quality Crucible Cast Steel, Rustless "Gun Metal" Finish, Fully Warranted

SHINGLING

Adze Eye, Octagon Neck, Round Poll

| No. | Cut | Per Box |
|---|---|---|
| 10 | 3½ in | $11.00 |
| 20 | 3⅜ in | 11.50 |

HALF

Adze Eye, Octagon Neck, Round Poll

| No. | Cut | Per Box |
|---|---|---|
| 10 | 3¼ in | $11.50 |
| 20 | 3½ in | 12.00 |

LATH

Adze Eye, Octagon Neck, Round Poll

| No. | Cut | Per Box |
|---|---|---|
| 10 | 2½ in | $11.00 |
| 20 | 2¾ in | 11.50 |

One-half Doz. in a Box

BARRELING

Especially Designed for Fruit Packers, for Boxing and Barreling

| No. | Cut | Per Doz. |
|---|---|---|
| 700 | 2¼ in | $12.00 |

# Colts Revolvers

Police Positive .32 Cal.

## POLICE POSITIVE

**Six Shots,** Jointless Solid Frame, Simultaneous Ejection, Swing out Cylinder, Rubber Stocks; when Chambered for .32 Long Colt, Shoots .32 Short and Long Colt Cartridges; when Chambered for .32 Police Positive Shoots .32 Police Positive and .32 Short and Long Smith & Wesson Cartridges

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .32 | 2½, 4 and 6 | $14.00 |

Blue Finish only from Stock

2½ and 6 inch from factory only.

Police Positive .38 Cal.

## POLICE POSITIVE

**Six Shots,** Jointless Solid Frame, Simultaneous Ejection, Swing out Cylinder, Rubber Stocks; Chambered for either .38 New Police or .38 Smith & Wesson Cartridges

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .38 | 4 and 6 | $14.00 |

Blue Finish only from Stock

6 inch from factory only.

.22 and .32 Police Positive Target

## POLICE POSITIVE TARGET

**Six Shots,** Jointless Solid Frame, Simultaneous Ejection, Swing out Cylinder, Rubber Stocks; when Chambered for .32 Long Colt Shoots .32 Short and Long Colt Cartridges; when Chambered for .32 New Police Shoots .32 New Police and .32 Short and Long Smith & Wesson Cartridges. When chambered for .22 W. R. F. caliber, shoots .22 Winchester Rim Fire Cartridges. When chambered for .22 Long shoots .22 Short, .22 Long and .22 Long Rifle Cartridges. Fitted with Special Target Sights.

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .22 W.R.F. | 6 only | $15 00 |
| .22 Long | 6 " | 15.00 |
| .32 | 6 " | 15 00 |

Blue Finish only

Police Positive Special

## POLICE POSITIVE SPECIAL

**Six Shots,** Jointless Solid Frame, Simultaneous Ejection, Swing out Cylinder, Rubber Stocks; when Chambered for .32 Caliber Handles .32-20 Rifle Cartridges, when Chambered for .38 Caliber Handles in the same Arm .38 Short and Long Colt and .38 S. & W. Special Full and Gallery Loads.

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .32-20 | 4 and 6 | $14.00 |
| .38 Colt | 4 and 6 | 14.00 |

Blue Finish only from Stock

Pocket Positive

## POCKET POSITIVE

**Six Shots,** Jointless Solid Frame, Simultaneous Ejection, Swing out Cylinder, Rubber Stocks, Chambered for .32 Short and Long Colt and for .32 Short and Long Smith & Wesson Cartridges; unless otherwise ordered .32 Colt will be furnished.

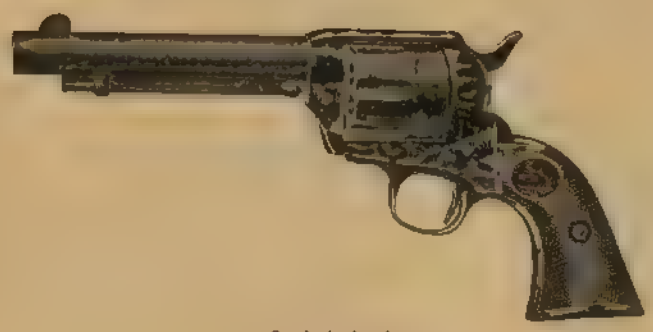
| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .32 | 2½, 3½ and 6 | $13.00 |

Blue Finish only from Stock

2½ and 6 inch from factory only.

For Parts, See Page 1829

# Colts Revolvers



Single Action Army

### SINGLE ACTION ARMY

Six Shots, Solid Frame, Rod Ejection, Rubber Stocks, when Chambered for .41 Long Colt, Shoots both .41 Long and Short Colt Cartridges.

| Caliber | Length Barrel in. | Each |
|---|---|---|
| .32 20 | 4¾-5½-7½ | $15.50 |
| .38 40 | 4¾-5½-7½ | 15.50 |
| .41 Colt | 4¾-5½-7½ | 15.50 |
| .44-40 | 4¾-5½-7½ | 15.50 |
| .45 Colt | 4¾-5½-7½ | 15.50 |

From Factory only

Bisley Model Single Action

### BISLEY MODEL, SINGLE ACTION

Six Shots, Solid Frame, Rod Ejection, Rubber Stocks, when Chambered for .41 Long Colt Shoots both .41 Long and Short Colt Cartridges. This Revolver is an Improvement over the S. A. Army Revolver.

| Caliber | Length Barrel in. | Each |
|---|---|---|
| .32 20 | 4¾-5½-7½ | $15 50 |
| .38-40 | 4¾-5½-7½ | 15 50 |
| .41 Colt | 4¾-5½-7½ | 15.50 |
| .44-40 | 4¾-5½-7½ | 15.50 |
| .45 Colt | 4¾-5½-7½ | 15.50 |

From Factory only

Bisley Model Target Single Action

### BISLEY MODEL TARGET, SINGLE ACTION

Six Shots, Solid Frame, Rod Ejection, Rubber Stocks, when Chambered for .41 Long Colt, Shoots .41 Short and Long Colt Cartridges, Special Target Sights.

| Caliber | Length Barrel in. | Each |
|---|---|---|
| .32 20 | 7½ only | $26 50 |
| .38-40 | 7½ only | 26 50 |
| .41 Colt | 7½ only | 26 50 |
| .44-40 | 7½ only | 26 50 |
| .45 Colt | 7½ only | 26.50 |

From Factory only

For Parts, See Page 1830

# Colt Automatic Pistols

.25 Caliber

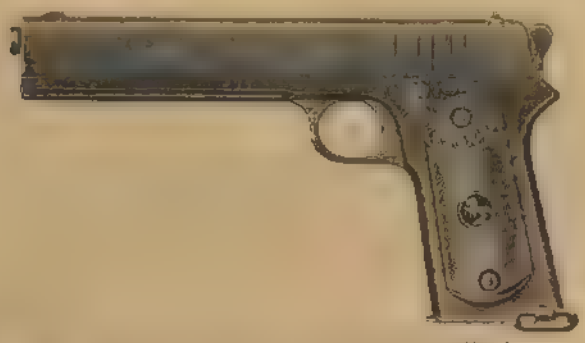
.32 Caliber

| | | Each |
|---|---|---|
| .25 | Caliber Hammerless, Capacity of Magazine 8 Shots, Length over all 4½ inches, Weight 12 oz., Blue Finish, Rubber Stocks | $15 00 |
| .25 | Caliber Magazine, Complete | 75 |
| .32 | Caliber Hammerless, Capacity of Magazine 8 Shots, Length over all 7 inches, Weight 24 oz., Blue Finish, Rubber Stocks | 15 00 |
| .32 | Caliber Magazine, Complete | .75 |

.380 Caliber Hammerless

.38 Caliber, Pocket Model

| | | Each |
|---|---|---|
| .380 | Caliber Hammerless, the Action Size and Weight the same as the .32 Caliber, but Enlarged above Capacity of Magazine 7 Shots, Blue Finish, Rubber Stocks | $17 50 |
| .380 | Caliber Magazine, Complete | .75 |
| .38 | Caliber Pocket Model, Capacity of Magazine 7 Shots, Length over all 7½ inches, Blue Finish, Rubber Stocks | 20 00 |
| .38 | Caliber Magazine, Complete | .85 |



.38 Caliber Military Model

.45 Caliber, with Combination Stock Attached

| | | Each |
|---|---|---|
| .38 | Caliber, Military Model Capacity of Magazine 8 Shots, Length over all 9 inches, Blue Finish, Rubber Stocks | $21 00 |
| .38 | Caliber Magazine, Complete | .85 |
| .45 | Caliber Capacity of Magazine 7 Shots, Length over all 8¼ inches, Checked Walnut Stocks, Blue Finish, Colt's Combination Stock and Holster can be attached to this Model as shown in Cut | 22 00 |
| .45 | Caliber Magazine, Complete | 1 00 |
| .45 | Caliber Military Model complete with Combination Stock and Holster, for .45 Caliber Automatic Pistol, made of Extra Quality Black Leather over Light Steel Frame Buckskin Lined | From factory only 30 00 |

For Parts, see Pages 1825 to 1827

# Smith & Wesson Revolvers

## DOUBLE ACTION HAMMERLESS

Double Action Hammerless Five Shots, Automatic Shell Extractor, Rubber Stocks

**Nickel or Blue**

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .32 | 3 | $15.00 |
| .38 | 3¼–4–6 | 16.00 |

**4 and 6 inch from factory only**

Cycle Double Action Hammerless Five Shots, Automatic Shell Extractor, Rubber Stocks

**Nickel or Blue**

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .32 | 2 | $15.00 |

**Blue only in Stock**

## DOUBLE ACTION HAMMER

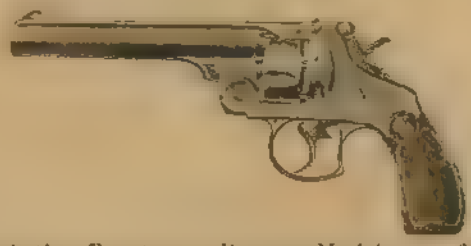
Double Action Hammer Five Shots, Automatic Shell Extractor, Rubber Stocks

**Nickel or Blue**

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .32 | 3 | $14.00 |

**3½, 4, 5 and 6 inch from factory only**

**Frontier or Russian Model**



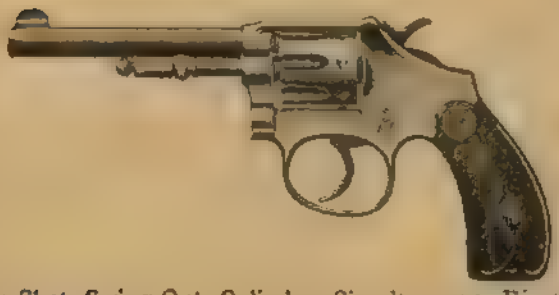
Double Action Frontier or Russian Model Six Shots Automatic Shell Extractor, Rubber or Checked Wood Stocks

**Nickel or Blue**

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .44 | 4–5–6–6½ | $16.00 |

**From factory only**

**Model 1902 Hand Ejector**

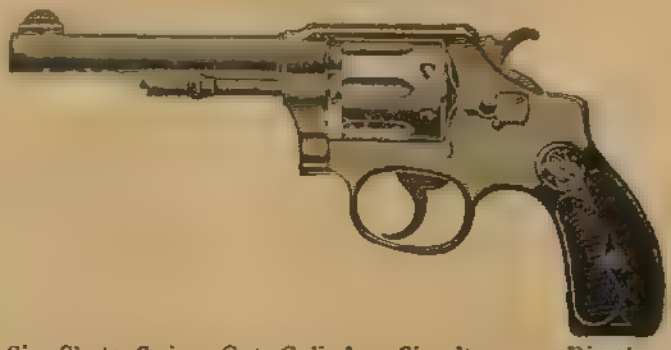


Seven Shot, Swing Out Cylinder, Simultaneous Ejection, Rubber Stocks, Shoots .22 Short and .22 Smith & Wesson Cartridges

**Nickel or Blue**

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .22 | 3 | $13.00 |

**Model 1903 Hand Ejector**



Six Shots, Swing Out Cylinder, Simultaneous Ejection, Rubber Stocks, Shoots .32 Smith & Wesson Long Cartridges

**Nickel or Blue**

| Caliber | Length Barrel, in. | Each |
|---|---|---|
| .32 | 3¼–4¼–6 | $14.00 |

# Lantern Assortment

## DIETZ JUNIOR

Dietz

The Dietz Junior "Blizzard" Lanterns, while comparatively small in size, give more light than many larger lanterns. Is of Cold Blast construction, patent side lever for raising and lowering the globe and the fount holds oil to burn thirteen hours. The assortment consists of 3 Junior tin, 2 Junior brass, 1 Junior brass nickel plated and 1 japanned Junior side lamp with ruby lens in rear of lamp—7 lanterns in all, packed in a light wooden case. Weight of case 25 lbs.

| | Each |
|---|---|
| **Junior Assortment** | $11.00 |

## DIETZ JUNIOR SIDE LAMP

**A new Side Light for Business Vehicles—See cut above**

This Lamp is about 12 inches high and is finished in black japan. Has a No. 1 burner, ⅝ inch wick. Is made on the Dietz "Cold Blast" principle. It reflects a light of 7 candle power. In addition to the bright tin reflector, it is equipped with a Dietz patent bulseye lens which magnifies the light considerably. The Lamp is provided with a strong clip spring for use on the left hand side of the vehicle. In this position it lights the road ahead and at the same time shows the red light clearly from the rear. In the center of the corrugated tin reflector on the back of the Lamp is a ruby lens through which a red light may be plainly seen for several hundred feet from the rear.

| | Per Doz |
|---|---|
| **Dietz Junior Side Lamps** | $24.00 |

Weight 30 pounds

# Tubular Lanterns

## RAYO

Nos. 75 and 90

Nos. 77 and 92

No. — Per Doz.

**75**–Size 0 Tubular, No. 1 Steel Burner and Cone, ⅝ in. Wick, No. 0 Globe ..... $8 50

One dozen in a case. Weight 33 lbs.

**90**–Size 0 Tubular, No. 1 Brass Burner and Cone, ⅝ in. Wick, No. 0 Select Globe. ..... 9 50

One dozen in a case. Weight 35 lbs.

No. — Per Doz.

**77**–Size 2 Cold Blast, No. 2 Tinned Steel Burner and Cone, 1 in. Wick, No. 2 Cold Blast Globe. . . $12 50

One-half dozen in a case. Weight 23½ lbs.

**92**–Size 2 Cold Blast, No. 2 Brass Burner and Cone, 1 in. Wick, No. 2 Cold Blast Globe ..... 15.00

One-half dozen in a box. Weight 25 lbs.

# Lanterns

## DIETZ MONARCH LIFT

No. 1 Burner, ⅝ in. Wick, No. 0 Globe

| No. | Per Doz. |
|---|---|
| 0–Best Lift, Side Clipper Lift. | $11 00 |

Gross Weight Doz. 37 lbs
One Doz. in a Case

## DIETZ VICTOR

All Brass

No. 1 Burner, ⅝ in. Wick, No. 0 Globe

| No. | Per Doz. |
|---|---|
| 0–Victor, All Brass Polished and Lacquered. .. ... .. | $30.00 |

Gross Weight Doz. 56 lbs.
One-half Doz. in a Case

## DIETZ LITTLE STAR

Tin

No. 1 Burner, ⅝ in. Wick, U. S. Globe

| No. | Per Doz. |
|---|---|
| Little Star, Tin ..... | $12.00 |

Gross Weight Doz. 27 lbs.
One Doz. in a Case

## GEM COLD BLAST

All Brass

Gem Cold Blast Burner No. 1, ⅝ in. Wick, Gem Globe

| No. | Per Doz. |
|---|---|
| 00–Gem Cold Blast, All Brass, Polished and Lacquered.. | $19 50 |
| 00–Gem Cold Blast, Tin, Polished and Lacquered . . .. | $15 00 |

Gross Weight Doz. 39 lbs.
One Doz. in a Case

## GOOD ENOUGH

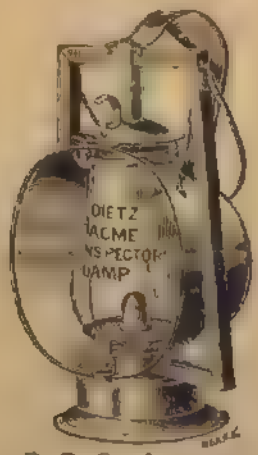
Glass Fount

No. 1 Burner, ⅝ in. Wick, No. 0 Globe

| No. | Per Doz. |
|---|---|
| 0–Goodenough, Side Lift..... | $13.00 |

Gross Weight Doz. 45 lbs.
One Doz. in a Case

## ACME INSPECTORS




For R. R. Car Inspectors, Etc.

No. 1 Long Cone Tubular Burner, ⅝ in. Wick, No. 0 Globe, Bright Tin Finish

| | Per Doz. |
|---|---|
| Acme Inspector..... | $23.00 |

Gross Weight Doz. 64 lbs.
One-half Doz. in a Case

# Lanterns

## RAILROAD

For Kerosene or Sperm Oil

Tin Bottom, Double Wire, Double Guard
No. 1 Ratchet or No. 1 Convex Burner, No. 39 Globe

| No. | | Per Doz. |
|---|---|---|
| **391** | Railroad, For Lard Oil Ratchet Burner | $12.00 |
| **392** | Railroad, For Coal Oil, Convex Burner | 12.00 |

Wire Bottom, Double Wire, Double Guard
No. 1 Ratchet or No. 1 Convex Burner, No. 39 Globe

| No. | | Per Doz. |
|---|---|---|
| **393** | Railroad, For Lard Oil, Ratchet Burner | $12.50 |
| **394** | Railroad, For Coal Oil Convex Burner | 12.50 |

One Doz. in a Case. Gross Weight Doz., 45 lbs.

## CONDUCTORS

No. 396

No. 1 Ratchet or No. 1 Convex Burner, No. 39 Globe

| No. | | Per Doz. |
|---|---|---|
| **395** | All Brass Double Guard | $37.00 |
| **396** | All Brass, Nickel Plated, Single Guard | $42.00 |

## STEEL CLAD RAILROAD

No. 397

With Outside Wick Raiser
No. 1 Ratchet or No. 1 Convex Burner, No. 39 Globe

| No | | Per Doz. |
|---|---|---|
| **397** | Retinned, Double Guard | $14.50 |

One Doz. in a Case. Gross Weight Doz., 50 lbs.

# Electric Heating Apparatus

## AMERICAN "STEEL CLAD" IRONS

Showing three component parts; Body of iron indestructible, Element a separate unit that can be replaced or renewed when necessary (merely slips in and out of body, connections made automatically); Cord and plugs that can be replaced or renewed when worn out; extra parts may be kept on hand, (all interchangeable).

No. 1. Top plate with handle and connectors; No. 2 Asbestos heat retaining wall preventing free radiation, and so saving the heat, thereby saving at least 20% of the energy and making this iron more efficient than any other; No. 3, Bottom plate; No. 4, "Steel Clad" element, practically a solid mass of steel; No. 5, Cord with detachable plug and separable attachment plug.

Note the "Steel Clad" iron has: Punched steel handle supports won't break if the iron falls; Ebonoid handle, lapped ends; Heavy, durable porcelain plug and connectors Special flexible cord, (own manufacture); Workmanship, highest class; Finish, full nickel, (the best).

### VOLTAGES

Many have the erroneous idea that the rating "Voltages 0 to 125," means that the device is made for operation on any voltage in between. This is a mistake, as this merely means that the articles are made for any of the various intermediate voltages, and it is therefore necessary to specify the exact voltage desired.

For instance, an article made for 110 volts if connected to 100 volt circuit, will heat but slowly and not to maximum temperature. On the other hand, a 100 volt device, connected to 125 volt circuit, will tend to overheat and there is a possibility of burnout. Therefore it is necessary to specify the voltage and to get devices adapted for the voltage of the circuit on which to be used.

Apparatus should not be connected to circuits of voltages varying more than about five per cent from that marked on the appliance.

This applies particularly to high temperature devices, such as soldering irons and heavy duty flat irons, as these articles tend to overheat more readily and quickly reach temperatures endangering the life of the heating elements. Of course some devices will stand a greater variation of pressure than others, for instance air heaters, curling iron heaters, etc., which do not heat to high temperature under ordinary conditions of usage.

### HEATING ELEMENTS MUST BE DURABLE

The heating Element must be mechanically strong, perfectly insulated, and so designed and constructed, that it will not readily burn out. "Steel Clad" Elements have no wire wound heating coils. They are practically one solid mass of steel. They are so strong mechanically, that they may be used as hammers. They are ample in size so that the heat may be readily dissipated, making them extremely durable.

### HEATING ELEMENTS MUST BE INTERCHANGEABLE

The Elements should be interchangeable so that a standard element of any voltage will fit in any Iron of the same size.

"Steel Clad" Elements are made by automatic machinery, and those of a certain type will fit into any Iron of the same type or size. Extra Elements may be kept on hand by a dealer in any Irons in stock and have a few extra Elements of odd voltages instead of complete Irons, and so take care of all requirements. In case Irons are already installed, and the voltage of the circuit is changed, it is but necessary to replace the Elements, not the complete Irons. These features are of the greatest importance and can be best appreciated by those who have had experience with electric Irons.

### CONDUCTING CORDS SHOULD BE DETACHABLE

The conducting cord should be detachable so that the current may be turned off by merely pulling off the plug, and so that the Iron may be taken away from the workbench and used elsewhere or for operations where the cord attached would be objectionable.

The "Steel Clad" Iron is equipped with a detachable cord and contact plug which answers these requirements. The current is turned on or off by merely attaching or detaching the plug. In case the cord burns, repairs may be made instantly, without the necessity of handling the Iron or waiting for it to cool, and by having an extra cord on hand, the same can be attached immediately, and the other repaired at leisure.

### MUST BE OF A PROPER SIZE, SHAPE AND WEIGHT

In order to obtain the best results the Iron must be of a proper size, proportionate shape and weight.

"Steel Clad" Irons are perfect in this respect. Twelve years of experience have taught us just what is necessary, and what is not.

### COST OF MAINTENANCE

Irons should be so designed and constructed, and should be so economical and durable, that the cost of operation and maintenance is reduced to a minimum.

"Steel Clad" Irons are practically indestructible. They are not only more efficient and more economical, but are also more durable, are more easily operated and can be maintained at a less cost than others. We are prepared to prove this to any one interested.

**In ordering, always specify voltage of circuit.**

# Electrical Heating Apparatus

## AMERICAN "STEEL CLAD" IRONS

No. 3L

**Nickel Plated Finish**

A very popular iron, particularly adapted for the use of travelers and in apartments, flats, hotels and other places where a small light iron is used from time to time for taking the creases out of shirt waists, ironing collars, and all the other innumerable small pieces. A practical necessity.

| No. | Volts | Watts | Weight | Each |
|---|---|---|---|---|
| 3L— | 0 to 125 | 250 | 3 lbs. | $4 75 |
| 3L— | 125 to 250 | 250 | 3 lbs. | 4 75 |
| Extra Elements | | | 0 to 125 Volts | 1 50 |
| | | | 125 to 250 Volts | 1 50 |

No. 5L

**Nickel Plated Finish**

This iron is adapted only for light dry work, in the apartment, home, factory, or elsewhere. It is used principally on small light pieces and in ironing collar and cuff and other factories where a small iron giving only a moderate heat, is required.

| No. | Volts | Watts | Weight | Each |
|---|---|---|---|---|
| 5L— | 0 to 125 | 350 | 5 lbs. | $5 00 |
| 5L— | 125 to 250 | 350 | 5 lbs. | 5 00 |
| Extra Elements | | | 0 to 125 Volts | 1 75 |
| | | | 125 to 250 Volts | 1 75 |

Each iron furnished complete with 6 foot cord, having detachable and separable attachment plugs, element, stand, etc., packed in a cardboard box. Extra cords, plugs, etc., listed on page 912.

No. 7L

**Nickel Plated Finish**

This is our **most popular Iron,** and there are many reasons for this. It is adapted for general all around work. It is a regular housekeeper and at the same time a regular laundry Iron. It is of the proper size, shape, weight and is made to give off a sufficient volume of heat to take care of all ordinary requirements. **We recommend this Iron for all purposes of this kind.**

| No. | Volts | Watts | Weight | Each |
|---|---|---|---|---|
| 7L— | 0 to 125 | 550 | 7 lbs. | $5 00 |
| 7L— | 125 to 250 | 550 | 7 lbs. | 5 00 |
| Extra Elements | | | 0 to 125 Volts | 1 75 |
| | | | 125 to 250 Volts | 1 75 |

Each iron furnished complete with 6 foot cord, having detachable and separable attachment plugs, element, stand, cord, suspension spring, etc., packed in a cardboard box.

No. 9L

**Nickel Plated Finish**

A heavy duty iron particularly adapted for very heavy laundry work, in fact work of any kind in laundries, leather factories and other places where an iron giving off a large volume of heat is required. This iron will keep up its temperature when used on heavy work and will answer the requirements satisfactorily where smaller irons would not.

| No. | Volts | Watts | Weight | Each |
|---|---|---|---|---|
| 9L— | 0 to 125 | 650 | 9 lbs. | $6 50 |
| 9L— | 125 to 250 | 650 | 9 lbs. | 6 50 |
| Extra Elements | | | 0 to 125 Volts | 2 50 |
| | | | 125 to 250 Volts | 2 50 |

No. 9L is furnished complete with detachable plug and cord, but not with lamp socket attachment plugs as this iron is usually installed permanently and is not attached to the ordinary lamp socket.

**In ordering, always specify voltage of circuit.** Extra cords, plugs, etc., listed on page 912.

# Electrical Heating Apparatus

## AMERICAN "STEEL CLAD" IRONS

Nos. 12P and 16P

### Nickel Plated Finish

Intended for light pressing of all kinds, such as coat work, ladies' tailor work; in fact for all purposes where a light or medium weight pressing iron is required.

The irons will give a sufficient volume of heat under all ordinary conditions of usage.. They are small enough so that they can be readily handled, still have a fair sized bottom surface in proportion to weight.

| No. | Volts | Watts | Weight | Each |
|---|---|---|---|---|
| 12P— | 0 to 125 | 625 | 12 lbs. | $ 9 50 |
| 12P— | 125 to 250 | 625 | 12 lbs. | 9 50 |
| 16P— | 0 to 125 | 625 | 16 lbs. | 10 50 |
| 16P— | 125 to 250 | 625 | 16 lbs. | 10 50 |
| Extra Elements | | | 0 to 125 Volts. | 3 50 |
| | | | 125 to 250 Volts. | 3 50 |

Furnished ready for attachment to circuit, but without lamp socket attachment plugs.

Each iron furnished complete with 6 foot cord having detachable contact plug, element, stand, etc., packed in a wooden box.

In ordering, always specify voltage of circuit.

Nos. 20P and 20HP

### Nickel Plated Finish

This is our most popular pressing iron and is standard in every particular. It is of the proper size and weight, and answers all requirements of tailors or manufacturers. It is a general all around iron, used for pressing, bushelmen's work, manufacturers' work, etc. **We recommend this size.**

The No. 20-P iron listed below is arranged to give a proper volume of heat for tailors and others, where the work is not constant and heavy as in the factory. The No. 20-H. P iron is arranged to give a larger volume of heat, and is designed especially to meet the requirements of manufacturers where the work is very heavy and the iron must keep up its temperature even if used constantly on the heaviest work. This iron consumes somewhat more current than the other.

| No. | Volts | Watts | Weight | Each |
|---|---|---|---|---|
| 20P | — 0 to 125 | 700 | 20 lbs. | $11 50 |
| 20P | —125 to 250 | 700 | 20 lbs. | 11 50 |
| 20HP— | 0 to 125 | 1000 | 20 lbs. | 12 00 |
| 20HP— | 125 to 250 | 1000 | 20 lbs. | 12 00 |
| Extra Elements | 20P — 0 to 125 Volts | | | 4 00 |
| | 20P —125 to 250 Volts | | | 4 00 |
| | 20HP— 0 to 125 Volts. | | | 4 25 |
| | 20HP 125 to 250 Volts. | | | 4 45 |

Furnished complete with 6 foot cord having detachable contact plug, element, stand, etc., but are not furnished with lamp socket attachment plugs, as they should not be attached to lamp sockets. Extra cords, plugs, etc., listed on page 912.

No. 24HP

### Nickel Plated Finish

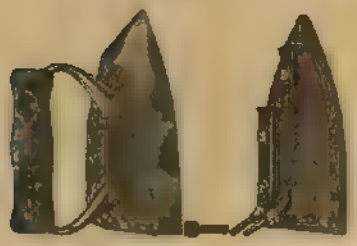
This iron is designed especially for the use of manufacturers. It is heavier than the ordinary tailor's iron, is made to keep up a constant temperature when used on the heaviest work, and will meet all requirements. It will keep up its temperature under most severe conditions. This iron is not intended for the use of tailors, but can be furnished with a special element that will give less heat.

| No. | Volts | Watts | Weight | Irons Each | Extra Elements Each |
|---|---|---|---|---|---|
| 24HP— | 0 to 125 | 1000 | 24 lbs. | $12 50 | $4 25 |
| 24HP— | 125 to 250 | 1000 | 24 lbs. | 12 50 | 4 25 |

Furnished complete ready for attachment to circuit. It is not furnished with a lamp socket plug, as an iron of this kind must not be connected to a lamp socket. Furnished complete with 6 foot cord, having detachable contact plug, element, stand, etc, packed in a wooden box. In ordering, always specify voltage of circuit. Extra cords, plugs, etc., listed on page 912.

# Electrical Heating Apparatus

## THE "SUPERIOR" IRON



Like the well known "Steel Clad" Iron, the "Superior" Iron consists of 3 principal component parts:

BODY OF IRON INTERCHANGEABLE ELEMENT DETACHABLE CORD AND PLUGS.

### SHAPE

The "SUPERIOR" is built on the plan of the old fashioned flat iron. No improvement has ever been made on this shape. The ironing surface is properly shaped for the most efficient work, being wide at the heel and you will note that the nose is cut-away thus allowing the user to get into the fine corners and perform the most delicate as well as the ordinary work. Any woman will appreciate this "point."

### ELEMENTS

This is the vital part of an electric iron. A glance shows you how the heating element in the "SUPERIOR" comes into the closest possible contact with the ironing surface, how it covers it at all points, thus insuring an even, strong and steady heat, how trouble is eliminated by simplicity, strength and durability, how easily and quickly a new element may be inserted.

Appeals to you, doesn't it?

You can readily see that the heat is thrown directly into the bottom where needed and is not lost through the top and sides. The heat is generated as rapidly as it is used, keeping the iron hot at all times, even though it is subjected to heavy work.

### REMOVABILITY OF ELEMENT

When necessary a new element may be quickly and easily inserted, thus saving time and trouble, and doing away with the necessity of returning anything to the factory. This feature has, of course, become absolutely essential in an up-to-date electric iron.

### DETACHABLE CORD

The "SUPERIOR" is furnished with a 6-foot cord, of the finest quality. The current is turned on and off by attaching or detaching plug at the iron. This is the best known method for reasons which must be obvious. First, if the iron becomes too hot, this is the most convenient place to turn off the current. Second, the iron may be readily removed for work in another part of the room. Third, work where there are many twists and turns of the iron calls for a speedy and easy detachment at the iron.

| No. | Volts | Watts | Weight | | Each |
|---|---|---|---|---|---|
| 6S— | 0 to 125 | 475 | 6 lbs. | Nickel polished | $ 4 00 |
| 6S —126 to 250 | | 475 | 6 lbs. | Nickel polished | 4 00 |
| Extra Elements | | 0–125 Volts | | | 1 50 |
| Extra Elements | | 126–250 Volts | | | 1 50 |

Each Iron is furnished complete with 6-foot cord, having detachable and separable Attachment Plugs and Heat Resisting Stand.

For extra Cords, Plugs, etc., see page 912.

IMPORTANT—When ordering, always state Voltage of the Circuit on which Irons are to be used.

# The Empire "Twenty"

One of the newcomers in the 1910 market is the Empire car. The Empire factory adds another automobile plant to the list of Indianapolis manufacturers. This car has been under development for the past year and the company maintains that through long and careful experimental work it has reached a very high state of perfection.

The Empire cars are put out in two models, namely, Model A and Model B. There is very little difference between the chassis of these two models, but the outward appearance differs considerably.

stretching of the exposed chain drive. This form of drive makes it possible to use a four sided platform spring suspension in the rear, which makes the car easy riding and extremely easy on tires.

The chassis differs considerably from the conventional type of the present day car, in that the power plant is not dependent on the frame for alignment of working parts. In fact, the power plant is the backbone of the car. The front of the motor is bolted to the frame at the central point of the front cross member. At the rear of the fly wheel housing is a large

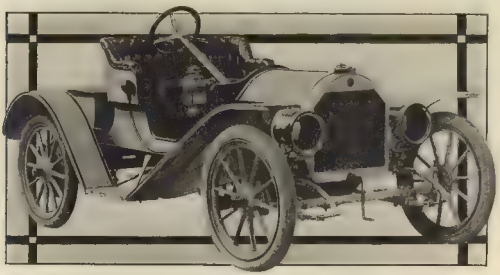


Fig. 1. Three-quarter view of the Empire "Twenty" Model A. 96-in. wheel base, 32x3½ in. tires with quick detachable rims, 20 H. P. motor, 4-cylinder, cast "en bloc," 3½ in. bore x 4 in. stroke, water cooled, valves 1⅝ in. dia. on opposite sides, splash system lubrication, cone clutch, selective sliding gear transmission, two speeds forward and one reverse, spark and throttle levers on steering column directly beneath the steering wheel, clutch and transmission brakes operated by pedal with ratchet stop, gasoline capacity, 11½ gallons. Equipment, 2 side oil lamps, tail lamp, horn, tools and tire repair kit. Price $900 f. o. b. Indianapolis.

In the Model A car, the body is more of the conventional form of runabout type, being suitable for three passengers by the addition of a rumble seat to the rear deck box.

The Model B is of distinctly racy lines. A round tank is carried on the rear deck, the gasoline being fed by means of a pressure pump to the carburetor. A large 18-in. steering wheel is used and a hand brake lever is added to the side. The car, when thus equipped, is considerably lighter than the Model A car, enabling it to carry a higher gear and making it a very speedy little roadster.

CHASSIS.

The principal features of the car are the chain drive and exceptionally easy riding qualities. The company claims to have developed a side chain drive which is more satisfactory than the average shaft drive. The chains are entirely enclosed in dust proof cases and these cases make them absolutely quiet and prevent the usual

steel flange into which a 3¾-in. steel tube is securely fastened. A similar flange on the rear end of this tube connects with the transmission, and the transmission is in turn supported at the ends of the frame, thus making a complete rigid unit, supported at three points.

The drive from the motor to the transmission is absolutely a straight line, there being no universal joints on the car.

The frame is built up of Cambria mild open hearth steel, the stock being the same as that used in bridge construction.

The fly wheel and clutch are completely enclosed in an aluminum housing. This housing has a large inspection plate in it and removing this plate allows examination of the clutch facing if necessary. The clutch is of the cone type, having an aluminum web faced with a patented composition facing, which makes it a very easy clutch to engage, and it has no tendency to slip.

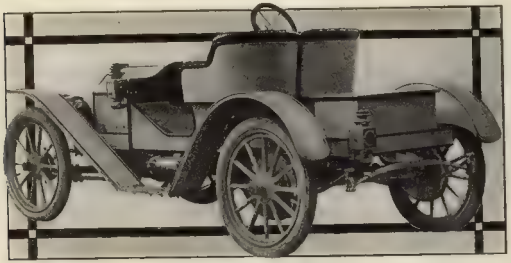


Fig. 2. Rear view of the Empire "Twenty" Model A showing the high road clearance; also the large luggage box on which a rumble seat can be placed

Ignition is by high tension magneto and transformer coil with a battery system used as an auxiliary, one set of plugs serving for either. The plugs are placed directly over the intake valves, insuring cool and clean sparking points. The magneto is driven from the timing gear of the motor by a large coupling of the Oldham type.

MOTOR

The motor is of the water cooled type, having four cylinders cast "en bloc," dimensions 3¾-in. bore by 4-in. stroke. This gives 19 3-5 H. P. by the A. L. A. M. rating, but as a matter of fact, the motor develops a little in excess of this, on account of the longer stroke.

The cylinder assembly is a radical departure from the usual lines of motor construction as may be noted by referring to Fig. 7, all of which shown being cast in one piece. A is the inside of the cylinder, B is the space into which the cylinder head is placed. The cylinder head is cast separately from the cylinder proper, and is held down by means of 20 studs and case hardened nuts, a copper asbestos gasket of the McKim type being used as packing. The intake manifold is cast integral and designated by the letter C, while D is the branch leading to the cylinder, E and F are the exhaust manifold and branch respectively. G, G are the water feed and return, while the letter H indicates the valve seats and openings for the valve stems and guides. The valves are 1¾-in. in diameter, which is just half the piston diameter, and they are placed on opposite sides. The valve stems are threaded and a hardened blind nut

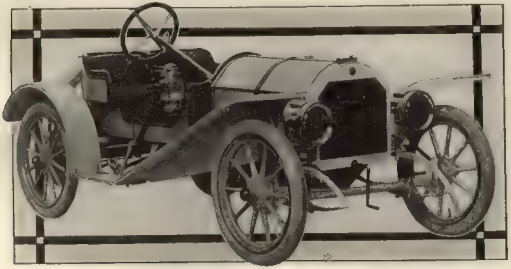


Fig. 3. Empire "Twenty" Model B, showing the McCord vertical tube radiator. The headpiece of this description shows another view of the same model. Particular attention is called to the extremely new lines of this construction. Chassis of this car is the same as that of Model A, with the addition of a set of brakes on the rear wheels controlled by a hand lever. Price $850.

and a hardened lock nut serve as an adjustment for the clearance between the valve and lifter, also giving a larger bearing surface where the valve strikes the lifter, thus obviating any tendency for the valve to dig into the lifter.

There is no water joint between the head and the cylinder, thus preventing any leakage of water into the cylinder barrels. The removable head makes it possible to remove any or all pistons and rods without dismantling any piping or disturbing any electrical conections, except the terminals of the spark plugs. The cylinders are made of very fine grade of gray iron. They are first rough bored, then annealed and allowed to rearrange their molecular structure. They are then rough reamed and set aside for a similar seasoning process, after which they are finished reamed. The crank shafts are made of 20 point carbon steel, drop forged and heat treated. After rough turning they are ground to the limits of .0005-in. on their diameters. These crank shafts are extremely rigid, due to the wide web and large diameter of the main bearings. The main bearings are of Parson's white bronze as are also the crank pin bearings. The connecting rods are drop forged, and on the lower end of the connecting rod cap a knife blade 2½-in. long is forged integral with same. These knife blades dip into the compartment in the crank case, thus making a very simple splash system of lubrication. The crank case compartment holds sufficient oil for from 75 to 100 miles running, and is replenished from an auxiliary tank by means of a hand pump which is mounted on the heel board This form of splash lubrication makes a very durable one as there are no working parts which are liable to go wrong such as mechanical pumps and sight feeds.

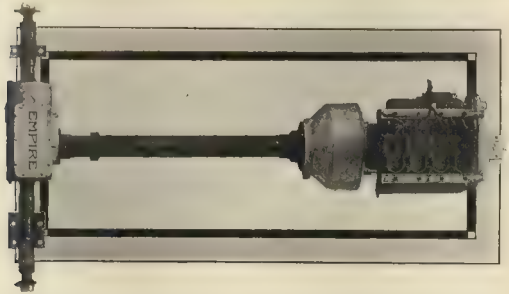



Fig. 4. Power plant, transmission and jack shaft. Note the unusual placing of the gear case parallel to the jack shaft. Also the three point suspension formed by the forward end of the motor and the extreme ends of the transmission arms. On the ends of these arms are the balls on which the chain cases swivel

TRANSMISSION

The transmission is of the two speed selective sliding gear type, direct drive on bevel gears. It is claimed by the company that this transmission is very durable and that there is little power lost in it, due to the small reduction from the propeller shaft to the counter shaft, namely, a ratio of 1 to 1.33. The case proper is made of aluminum, while its supporting arms are of steel, these arms forming a rear member of the three point support for the complete power unit. On the ends of these arms are mounted two steel balls of large diameter, the forward ends of the pressed steel chain cases swivel on these balls, thus forming a ball joint for the cases. The latter also act as strut rods. On the counter shaft of the transmission is mounted a contracting band brake, this brake being lined with a patented composition lining. The brake is actuated by the clutch pedal and in order that the clutch spring will not be weakened by the use of this transmission brake, a cam motion for releasing the clutch is resorted to. A slight pressure on the clutch pedal releases the clutch, and further pressure applies the transmission brake, but does not compress the clutch spring beyond its initial compression.

REAR AXLE

The rear axle is built up from two inch tubing with 7-32-in. wall. Into this tubing are fastened the rear axle spindles, these latter being 1 5-16-in. in diameter. The rear hub sprockets are drop forgings bolted to the hubs of the rear wheels.

These forgings are turned on the internal diameter, forming brake drums for the rear hub brakes, the latter being of bronze, ten inches in diameter and one and one half inches wide on their face. The chain cases also enclose these brakes making the entire mechanism dust proof throughout. The chains are of the roller

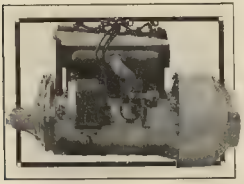


Fig. 5. Intake side of the Empire "Twenty" motor showing magneto and carburetor location. Note the general simplicity of design

type, diamond No. 300, ¾ pitch and 15-32 diameter roller, this size being unusually large for a car of this weight. The chain adjustment is secured by means of a pressed steel clamping ring. This ring fits over the ball joint on the transmission arms. An eccentric throw of ¾-in. serves to loosen or tighten the chains.

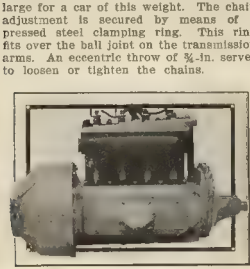


Fig 6 Exhaust side of the Empire "Twenty" motor showing the cone clutch housing. Attention is called to the clutch housing inspection plate and the inspection plate on the crank case.

FRONT AXLE

The front axle is built up from 2-in. tubing having 7-32-in. wall. The steering knuckles are of generous proportions and are brazed to the 2-in. tubing. The axle spindles are 1 5-16-in. in diameter, this being the same as the rear.

WHEELS AND TIRES

The front wheels have ten spokes 1¼-in. in diameter, second growth hickory. The rears have twelve spokes of the same size and material. The hubs have cup and cone type bearings, with half inch balls at the outer end and ⅝-in. at the inner end. The wheels are fitted with quick detachable rims and 32 x 3½-in. tires. Hub caps are brass stampings.

CONTROL

The spark and throttle levers are mounted on the steering column directly beneath the steering wheel, and an accelerator pedal is interconnected with the throttle lever on the steering column. The gear shift lever is at the driver's right operating in an H slot. On both Model A and B, the clutch and transmission brakes are operated by pedal having a ratchet attachment, while on Model B, the rear hub brakes are operated by hand lever and ratchet.

All brake rods have a turn buckle adjustment which is spring retained, making brake adjustment very easy, as the brake rods can be lengthened or shortened by the turn buckle which automatically locks itself in any position.

Fig. 7. Cross section through cylinder of the Empire "Twenty" motor showing the intake and exhaust manifolds, which are cast integral with the cylinders. Detailed explanation of letters given in text.

The steering gear is of the pinion and sector type, pinion shaft being hardened and ground and both bearings are of Parson's white bronze. These parts are enclosed in a dust proof aluminum case.

A genuine mahogany rim 15 inches in diameter on Model A and 18 inches for Model B is used for the hand wheel, the web being of aluminum.

GASOLINE CAPACITY

On the Model A cars a square tank with a brass settling chamber is carried under the seat, feed to the carburetor being by gravity. The tank holds 11½ gallons.

On the Model B, the tank is carried on the rear deck and holds 12½ gallons. Gasoline is fed to the carburetor by pressure feed.

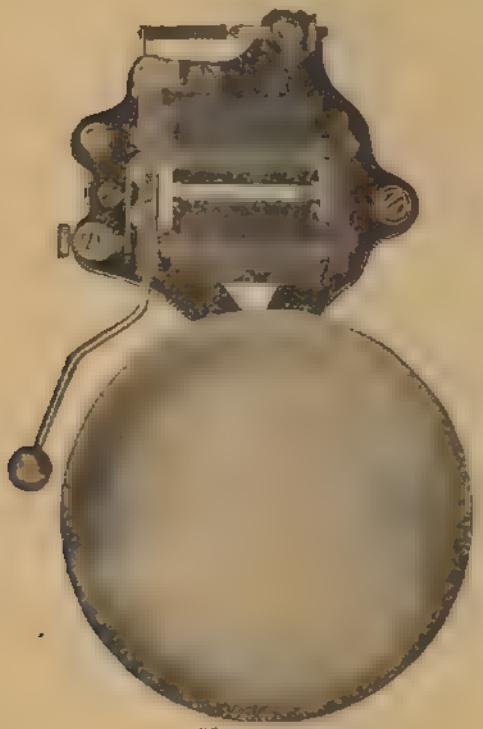
FINISH AND EQUIPMENT

The Empire cars are regularly finished in a light gray with black striping. The dash boards are mahogany and all parts such as throttle and spark control levers, steering column side levers, etc., are brass and the running boards are aluminum.

The cars are regularly equipped with oil side lamps, tail lamp, horn and tube, tools and kit and tire tools.

The price is $800 for the Model A car, and for the Model B car, $850 f. o. b. Indianapolis.

# Pivoted Armature Skeleton Bells



"Competition"

"Faraday"

## FARADAY—CLASS A

These bells have non-turning and non-loosening binding posts. Bell is at all times insulated from the frame. Contact points are made of pure platinum or platinoid as specified. Gongs are cast brass.

| No. | Size Gong | Contacts | Resistance Ohms | Each |
|---|---|---|---|---|
| 4 | 4 in. | Platinoid | 1.5 | $ 1 96 |
| 5 | 5 in. | Platinoid | 2 1 | 2 84 |
| 6 | 6 in. | Platinoid | 2 1 | 3 20 |
| 7 | 7 in. | Platinoid | 3 0 | 4 56 |
| 8 | 8 in. | Platinoid | 3 0 | 5 60 |
| 10 | 10 in. | Platinoid | 5 2 | 8 00 |
| 12 | 12 in. | Platinoid | 5 2 | 10 00 |

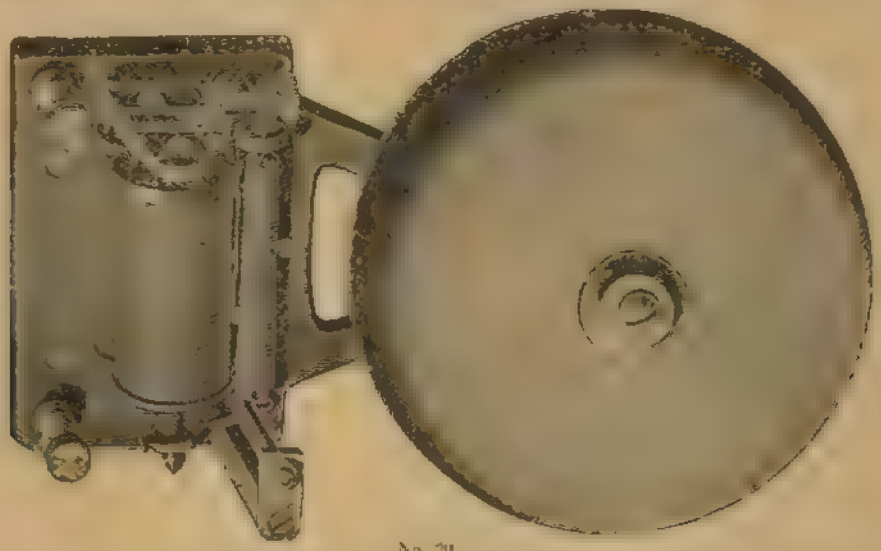
Unless otherwise specified, Platinoid [illegible]
For pure Platinum points add [illegible]

## COMPETITION CLASS B

These bells have non-turning binding posts. Works are not insulated from the frame. Contact points are made of pure silver, instead of platinum. Gongs are made of stamped steel.

| No. | Size Gong | Contacts | Resistance Ohms | Each |
|---|---|---|---|---|
| 4 | 4 in. | Pure silver | 1.5 | $ 1 56 |
| 5 | 5 in. | Pure silver | 2.1 | 2 30 |
| 6 | 6 in. | Pure silver | 2.1 | 2 44 |
| 8 | 8 in. | Pure silver | 3.0 | 4 44 |
| 10 | 10 in. | Pure silver | 5 2 | 6 88 |
| 12 | 12 in. | Pure silver | 5 2 | 7 66 |

# "Vigilant" Single Stroke and Vibrating Bells



No. 20

**A Perfect Signal Bell for Railroads, Depots, Schools, Fire Alarms, etc.**

The length of stroke and the tension are adjustable.

It can be arranged as a Single Stroke and Vibrating Bell or, as a Series Bell so arranged that at every stroke its magnets are cut out and the current shunted on to the line, enabling any number of bells to be operated in series.

The very best grade of cast gongs used.

Single Stroke bells can be adjusted to the required resistance to operate on direct current up to 500 volts. We do not recommend the Vibrating style for higher voltage than 110 volts.

6 in. size finished with japan base. All other parts in polished nickel plate. Larger size gongs binding posts, etc., are finished in polished bronze.

| No. | Size Gong | Resistance | Single Stroke | Vibrating | Combination Single Stroke or Vibrating | Series |
|---|---|---|---|---|---|---|
| 20— | 6 in. | 6 Ohms | $ 8 50 | $ 9 50 | $10 50 | $10 50 |
| 20 | 7 in. | 6 Ohms | 9 50 | 10 50 | 11 50 | 11 50 |
| 20 — | 8 in. | 6 Ohms | 14 00 | 15 50 | 16 50 | 16 50 |
| 20 — | 9 in. | 6 Ohms | 15 00 | 16 50 | 17 50 | 17 50 |
| 20— | 10 in. | 6 Ohms | 16 50 | 18 50 | 19 50 | 19 50 |
| 20— | 12 in. | 6 Ohms | 18 00 | 20 00 | 21 00 | 21 00 |

No. 21

Same as No. 20, for use in exposed places.

| No. | Size Gong | Resistance | Single Stroke | Vibrating | Combination Single Stroke or Vibrating | Series |
|---|---|---|---|---|---|---|
| 21— | 6 in. | 6 Ohms | $10 00 | $11 00 | $11 50 | $11 50 |
| 21 — | 7 in. | 6 Ohms | 11 00 | 12 00 | 12 50 | 12 50 |
| 21 | 8 in. | 6 Ohms | 15 50 | 17 00 | 17 50 | 17 50 |
| 21 — | 9 in. | 6 Ohms | 16 50 | 18 00 | 18 50 | 18 50 |
| 21— | 10 in. | 6 Ohms | 18 00 | 19 50 | 20 00 | 20 00 |
| 21— | 12 in. | 6 Ohms | 20 00 | 22 00 | 22 50 | 22 50 |

# Faraday Weatherproof Signal Bells

Model A
Standard Type

## STANDARD TYPE

Plain Case.

| Size of Gong | Resistance in Ohms | Model A No. | Model A Each | Model B No. | Model B Each | Model C No. | Model C Each |
|---|---|---|---|---|---|---|---|
| 3½ in. | 1.5 | A 9378 | $ 5 60 | B 9378 | $ 6 35 | | |
| 4 in. | 1.5 | A 9379 | 5 75 | B 9379 | 6 50 | | |
| 5 in. | 2.1 | A 9380 | 7 50 | B 9380 | 8 50 | C 9380 | $15 50 |
| 6 in. | 2.1 | A 9381 | 8 50 | B 9381 | 10 00 | C 9381 | 16 50 |
| 7 in. | 3.0 | A 9382 | 9 50 | B 9382 | 11 00 | C 9382 | 21 50 |
| 8 in. | 3.0 | A 9383 | 10 50 | B 9383 | 12 50 | C 9383 | 22 50 |
| 9 in. | 5.2 | A 9384 | 13 50 | B 9384 | 15 50 | C 9384 | 31 50 |
| 10 in. | 5.2 | A 9842 | 16 50 | B 9842 | 18 50 | C 9842 | 34 50 |
| 12 in. | 5.2 | A 9843 | 22 50 | B 9843 | 25 00 | C 9843 | 46 50 |

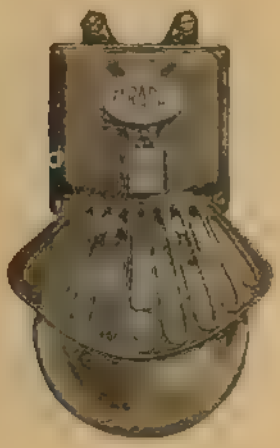
## INSPECTORS' TYPE

Furnished with either Model A, B, or C Covers.

Particularly recommended where regular inspections are made, as in Railroad Work, Fire Alarm, etc.

| Size of Gong | Resistance in Ohms | Model A No. | Model A Each | Model B No. | Model B Each | Model C No. | Model C Each |
|---|---|---|---|---|---|---|---|
| 3½ in. | 1.5 | AI 9378 | $ 7 60 | BI 9378 | $ 8 35 | | |
| 4 in. | 1.5 | AI 9379 | 7 75 | BI 9379 | 8 50 | | |
| 5 in. | 2.1 | AI 9380 | 10 00 | BI 9380 | 11 00 | CI 9380 | 18 00 |
| 6 in. | 2.1 | AI 9381 | 11 00 | BI 9381 | 12 00 | CI 9381 | 20 00 |
| 7 in. | 3.0 | AI 9382 | 12 50 | BI 9382 | 14 00 | CI 9382 | 24 50 |
| 8 in. | 3.0 | AI 9383 | 13 50 | BI 9383 | 15 00 | CI 9383 | 25 50 |
| 9 in. | 5.2 | AI 9384 | 17 00 | BI 9384 | 19 00 | CI 9384 | 35 00 |
| 10 in. | 5.2 | AI 9842 | 20 00 | BI 9842 | 22 00 | CI 9842 | 38 00 |
| 12 in. | 5.2 | AI 9843 | 27 00 | BI 9843 | 28 50 | CI 9843 | 50 00 |

# Faraday Weatherproof Signal Bells



Model B-L
Lock Type

Model B-C
Conduit Type

## LOCK TYPE

**Furnished with either Model A, B or C Covers.**

Equipped with a device permitting positive locking of mechanism from any one not having proper keys

| Size of Gong | Resistance Ohms | Model A No. | Model A Price | Model B No. | Model B Price | Model C No. | Model C Price |
|---|---|---|---|---|---|---|---|
| 3½ in. | 1.5 | AL 9378 | $14 60 | BL 9378 | $15 35 | | |
| 4 in. | 1.5 | AL 9379 | 14 75 | BL 9379 | 15 50 | | |
| 5 in. | 2.1 | AL 9380 | 17 00 | BL 9380 | 18 00 | CL 9380 | $25 00 |
| 6 in. | 2 1 | AL 9381 | 18 00 | BL 9381 | 19 00 | CL 9381 | 27 00 |
| 7 in. | 3 0 | AL 9382 | 19 50 | BL 9382 | 21 00 | CL 9382 | 31 50 |
| 8 in. | 3 0 | AL 9383 | 20 50 | BL 9383 | 22 00 | CL 9383 | 32 50 |
| 9 in. | 5.2 | AL 9384 | 24 00 | BL 9384 | 26 00 | CL 9384 | 42 00 |
| 10 in | 5 2 | AL 9842 | 27 00 | BL 9842 | 29 00 | CL 9842 | 45 00 |
| 12 in | 5 2 | AL 9843 | 33 00 | BL 9843 | 35 50 | CL 9843 | 57 00 |

## CONDUIT TYPE

**Furnished with either Model A, B or C Covers.**

The bell frame itself is an outlet box cover fitting down on a rubber gasket. All terminals and connections are inside and the bell is weather-proof in every particular.

| Size of Gong | Resistance Ohms | Model A No. | Model A Price | Model B No. | Model B Price | Model C No. | Model C Price |
|---|---|---|---|---|---|---|---|
| 3½ in. | 1 5 | AC 9378 | $13 60 | BC 9378 | $14 35 | | |
| 4 in. | 1.5 | AC 9379 | 13 75 | BC 9379 | 14 50 | | |
| 5 in. | 2 1 | AC 9380 | 17 50 | BC 9380 | 18 50 | CC 9380 | $23 50 |
| 6 in. | 2.1 | AC 9381 | 18 50 | BC 9381 | 20 00 | CC 9381 | 24 50 |
| 7 in | 3 0 | AC 9382 | 21 50 | BC 9382 | 23 00 | CC 9382 | 31 50 |
| 8 in. | 3.0 | AC 9383 | 22 50 | BC 9383 | 24 50 | CC 9383 | 32 50 |
| 9 in | 5 2 | AC 9384 | 27 50 | BC 9384 | 29 50 | CC 9384 | 45 50 |
| 10 in. | 5 2 | AC 9842 | 30 50 | BC 9842 | 32 50 | CC 9842 | 48 50 |
| 12 in | 5 2 | AC 9843 | 37 50 | BC 9843 | 46 00 | CC 9843 | 61 50 |

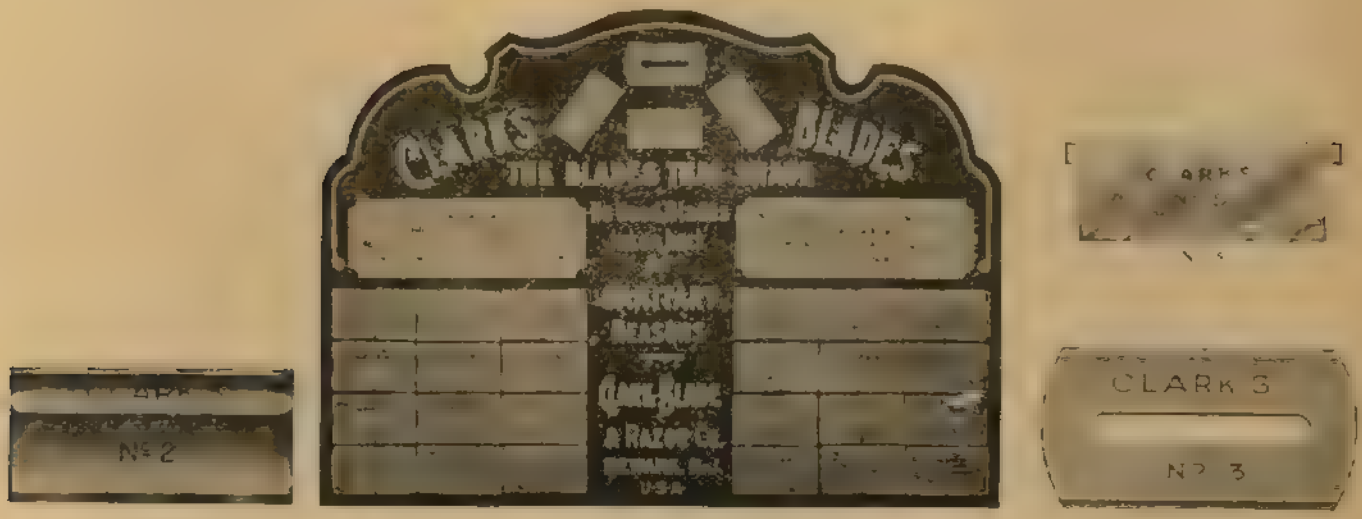
# Gillette Safety Razor

POCKET EDITION

No. 502

| No | | Each |
|---|---|---|
| 501 | —Basket Pattern Silver Plated Metal Case and Razor. | $ 5.00 |
| 501A | —Basket Pattern Gun Metal Case and Gold Plated Razor | 5.50 |
| 501B | —Basket Pattern Gold Plated Case and Gold Plated Razor | 6.00 |
| 502 | —Shell Pattern Silver Plated Metal Case and Razor .. | 5.00 |
| 502A | —Shell Pattern Gun Metal Case and Gold Plated Razor | 5.50 |
| 502B | —Shell Pattern Gold Plated Case and Gold Plated Razor | 6.00 |
| 505 | —Standard Morocco Leather Case, Silver Plated Razor .. | 5.00 |
| 505A | —Standard Pig Skin Case, Silver Plated Razor..... | 5.50 |

# Clark's Safety Razor Blades




No. 2 No. 3

Clark's Safety Razor Blades, packed six in a package. One gross or 24 packages, on easel as illustrated

| No. | | Per Doz. |
|---|---|---|
| **2**—Blade is 1 5/8 inches long, 3/4 inch wide with back and will fit the **"Star," "Ever Ready," "Gem Junior"** and **"Sharp Shaver"** Razors. | | $ 0.50 |
| **7**—Blade is 1 3/4 inches long, 7/8 inch wide and will fit **"Gillette"** and **"Clark"** Razors | | .90 |
| **5**—Blade is 1 1/8 inches long, 1/8 inch wide, and will fit the **"Enders"** Razors | | .50 |
| **2-5 Assortment**—Contains one-half gross each of Nos. 2 and 5 on easel card | | .50 |

# Safety Razors

## GILLETTE

No. 460

460 Standard Silver Plated Razor in Morocco leather case ..... $ 5.00

| | Per Set |
|---|---|
| **Extra Blades** 12 in set ..... | 1.00 |
| **Extra Blades** 6 in set ..... | .50 |

No. 460B

| No. | | Each |
|---|---|---|
| 460B | Standard 12 Blade Gillette Set in Triple Silver Plated Case ..... | $5.00 |

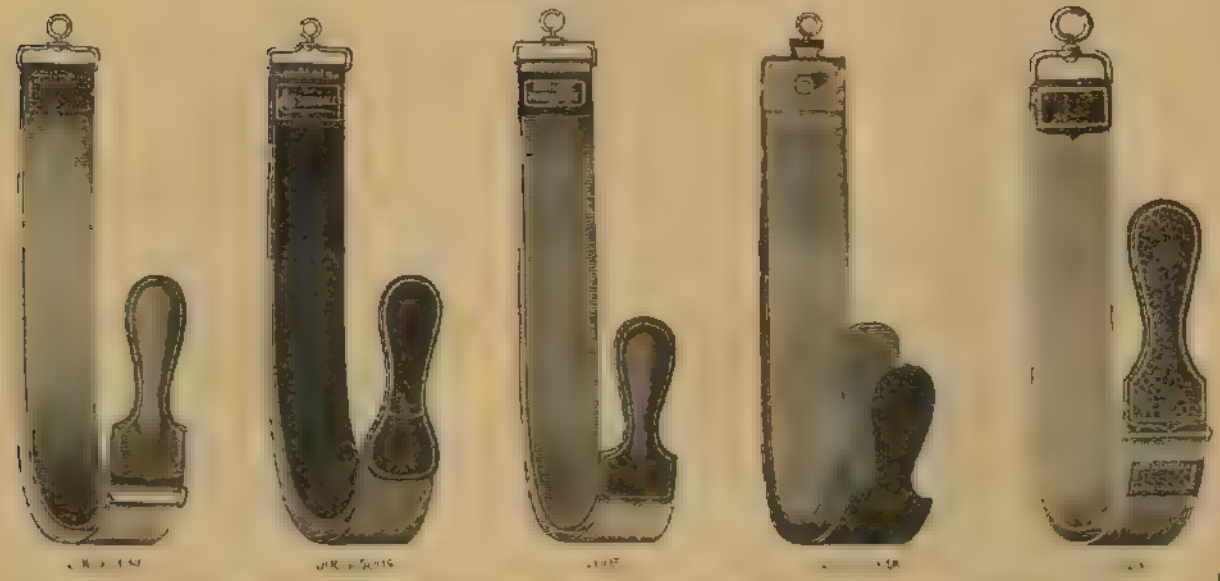
## COMBINATION SETS

No. 461

No. 00

| No. | | Each |
|---|---|---|
| 461 | —Standard Triple Silver Plated Razor with Twelve Blades, and Shaving Stick in Silver Plated Holders Collapsible Badger Hair Brush, Velvet Lined Morocco Grain Leather Case ..... | $ 6.00 |
| 00 | —Standard Triple Silver Plated Razor with Twelve Blades Shaving Stick and Badger Hair Brush in Silver Plated Holders, all contained in Seal Grain Leather Case ..... | 6.50 |

# Razor Strops



No. Per Doz.

**5000** 2 x15 Select Horsehide, Finished Hose Canvas Web, Padded Swivel Handle, Nickel Swivel Top $ 4 00

**5005**–2 x17–Black Diamond Horsehide Finished Hose Canvas Web, Double Swing Flat Handles Nickeled Swivel Top 4.00

**5008**–2 x14–Hone Strop Red and Black Diamond Horsehide Padded Handle Nickel Swivel Top 8 00

**5027**–2¼x18–Genuine Shell Finished Horsehide Combined with Fine Web Canvas Flat Double Swing Handles, Patent Swivel Top 12.00

**7005**–2 x15½–Shell Finish Black Diamond Horsehide with Black Diamond Web Stitched Flat Handle, Nickel Swivel Top 6.50

**7015**–2 ¼x16 Red Horsehide Combined with Finished Web Padded Handle Nickel Concave Swivel 7.50

**7080**–1¾x11–Tourist and Safety Razor, Swaty Padded and Black Diamond Horsehide, Padded Swivel Handle Nickel Swivel Top 8 00

**7090**–2¼x19–Select, Shell Finish Tan Horsehide Combined with Purple Hose, Flat Double Swing Handles, Nickel Swivel Top 18 00

No. Per Doz.

**5003**–2 x13–Red Finished Horsehide Hose Canvas Web Stitched Leather Handle Nickeled Swivel Top $ 4.00

**5017**–2¼x18–Genuine Natural Finish Russia Leather Combined with Black Diamond Web, Double Swing Stitched Handles, Nickel Swivel Top 15 00

**7010**–2 x15½–Buff Horsehide, Combined with Finished Web Leather Double Swing Handles, Nickeled Swivel Top 7 50

**7025** 2¼x16–Brown Horsehide, with Black Diamond Web, Padded Double Swing Handles, Swivel Top. 10.00

**5031**–2¼x17–Hone Strop, Red and Black Diamond Horsehide, Flat Double Swing Handles Patent Swivel Top 14 00

All Above One-half Doz. in a Box

# Magneto Telephones

No. 2550

## "COMPACT"—DRY BATTERY STYLE WALL SETS

| No. | | | | Each |
|---|---|---|---|---|
| **2614**—Series Set | 3 Bar Generator | 80 Ohm Ringer, Oak Case, with Dry Batteries | | $20 00 |
| **2550**—Bridging Set | 4 Bar Generator | 1000 Ohm Ringer, Oak Case with Dry Batteries | | 23 50 |
| **2594**—Bridging Set | 4 Bar Generator | 1600 Ohm Ringer, Oak Case, with Dry Batteries | | 23 70 |
| **2596**—Bridging Set | 5 Bar Generator | 1000 Ohm Ringer, Oak Case with Dry Batteries | | 26 50 |
| **2576**—Bridging Set | 5 Bar Generator | 1600 Ohm Ringer, Oak Case, with Dry Batteries | | 26 70 |
| **2602**—Bridging Set | 5 Bar Generator | 2000 Ohm Ringer, Oak Case, with Dry Batteries | | 27 00 |

Desk Stand

Bell and Generator

## PORTABLE DESK TELEPHONES

| No. | | | | Each |
|---|---|---|---|---|
| **2201**—Series Set | 3 Bar Generator | 80 Ohm Ringer, Oak Case, with Dry Batteries | | $21 50 |
| **2207** Bridging Set | 4 Bar Generator | 1000 Ohm Ringer, Oak Case, with Dry Batteries | | 25 00 |
| **2209** Bridging Set | 4 Bar Generator | 1600 Ohm Ringer, Oak Case, with Dry Batteries | | 25 20 |
| **2210** Bridging Set | 5 Bar Generator | 1000 Ohm Ringer, Oak Case, with Dry Batteries | | 28 00 |
| **2210** Bridging Set | 5 Bar Generator | 1600 Ohm Ringer, Oak Case with Dry Batteries | | 28 20 |
| **2210** Bridging Set | 5 Bar Generator | 2000 Ohm Ringer, Oak Case with Dry Batteries | | 28 50 |

The Desk Type Telephone consists of Desk Stand and Desk Set Box, containing Ringer, Induction Coil and Generator with cord for connecting from desk stand to generator.

### DUPLEX TELEPHONE

A small Battery Telephone designed for private line use with one telephone at each end of the line, and not to exceed 2000 feet apart.

| | Per Pair |
|---|---|
| Duplex Telephones | $13 00 |

Batteries not included.

### EXTENSION BELL

These are for use on Magneto Telephone Circuits and the resistance of the ringer coils must correspond to the resistance of the ringers used in the telephones used on the same circuit.

**Extension Bells**

| | Each |
|---|---|
| With 80 Ohm Ringer | $ 4 00 |
| With 1000 Ohm Ringer | 6 50 |
| With 1600 Ohm Ringer | 7 20 |

### TESTING MAGNETO

These are High Grade, well made Testing Magnetos, made with metal corners.

| No. | Each |
|---|---|
| 9025—25,000 Ohms, Oak Case | $14 00 |
| 9050—50,000 Ohms, Oak Case | 15 40 |

## Combination Bell and Push

Style "A"—Size 2¼x6¾ in.

This is the smallest and handsomest Metal Combination Bell and Push Button manufactured. Within the limited space of 2¼x6¾ in. is placed a Double Adjusted Bell made with platinum points which can be adjusted without removing it from the wall. The Binding Posts, of which there are three, are made with particular reference to obtaining security from loosening and the wire slipping from under the connections. The Posts are fastened to the base with two screws riveted.

The 3-Point Push in this Bell is made in such a manner that the spring used to make the necessary closed contact will not become "set" and cause the bell to refuse to ring, as is liable to occur when care is not used in regard to this important detail.

| No. | Each |
|---|---|
| 45732 | $1 50 |

# Adjustable Telephone Brackets

No. 85

No. 83—Single Bracket

## FOR FLAT TOP DESK

| No. Extension with Clamp | Each |
|---|---|
| 83—23 in. ( 8 links 7 in.) | $ 3 50 |
| 83 27 in (10 links 7 in ) | 4 00 |
| 83 32 in. (12 links 7 in.) | 4 50 |
| 83—36 in. (14 links 7 in.) | 5 00 |

## FOR ROLL TOP DESK OR WALL

| No Extension with Clamp | Each |
|---|---|
| 85 -23 in. ( 8 links 7 in.) | $ 3 50 |
| 85—31 in. (10 links 8 in.) | 4 00 |
| 85—36 in. (12 links 8 in.) | 4 50 |
| 85—36 in. (14 links 7 in.) | 5 00 |

No. 833—Double Bracket

## FOR FLAT TOP DESK

| No. Extension with Clamp | Each |
|---|---|
| 833 23 in. ( 8 links 7 in.) | $ 6 00 |
| 833 31 in. (10 links 8 in.) | 7 00 |
| 833 36 in. (12 links 8 in.) | 8 00 |
| 833—36 in. (14 links 7 in.) | 9 00 |

All of the above Telephone Brackets
If ordered with No. 86 Mounting

## FOR ROLL TOP DESK OR WALL

| No. | Each |
|---|---|
| 855 23 in. ( 8 links 7 in.) | $ 6 00 |
| 855 27 in. (10 links 7 in.) | 7 00 |
| 855 32 in. (12 links 7 in.) | 8 00 |
| 855 36 in. (14 links 7 in.) | 9 00 |

## EXTRA PARTS

No. 81

No. 86

| No. Article | Each |
|---|---|
| B—Telephone Clamp | $ 0 35 |
| 81—Mounting | 45 |
| 83—Mounting | 45 |

| No. Article | Each |
|---|---|
| 85—Mounting. | $ 0 45 |
| 86—Mounting. | 7 |
| 23 in. Arm Only | 2 60 |

# Toy Motors

### ELECTRIC ENGINE

This small Electrically Driven Engine is strong, practical, educating and absolutely safe. The controlling lever governs the speed and also the direction of the drive. **Cast Iron Frame and all parts well made. A grooved pulley is provided so that the engine may be used to run toy workshops, etc. Operated by one or two Dry Batteries, according to strength required.**

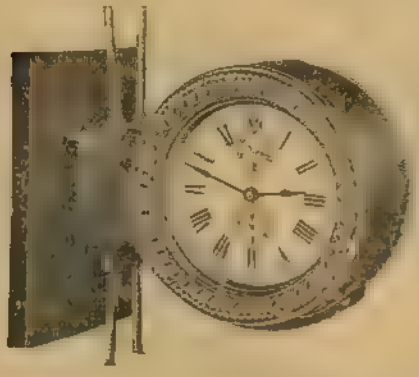
| No. | Each |
|---|---|
| 1013. . . . . | ..$1 35 |

### TOY MOTOR

This is a well made little motor. Will operate on one or two cells Dry Battery. All parts are neatly finished and the motor is mounted on a polished wood base.

| No. | Each |
|---|---|
| 1—Motor. . . . . | $1 35 |

# Time Switches



Cut showing front view.

Cut showing rear view.

### FOR WINDOW LIGHTS, SIGNS, ETC.

The simplest and most reliable time switch to use, requires no metal box or cabinet. Just wind the clock, turn on lights and they will be turned off automatically at the time for which the alarm is set. A High Grade Seth Thomas clock movement and standard push button switch are used. The clock is exposed and if conveniently located will serve as a time piece also. Knockout holes are provided in slate base for concealed wiring.

| No. | Each |
|---|---|
| **16450** For throwing lights off only—10 amp. 250 Volts D. P. | $16 00 |

### BURGLAR ALARM LOCK SWITCH

These Switches are placed on the doors of stores, residences and other buildings connected with burglar alarm systems, so that persons having the proper keys can go in and out of the building without ringing the alarm.

| No. | Each |
|---|---|
| **1602**—Yale Lock (3 keys), with Rod . . . . . | $5 00 |
| **1603**—Corbin (3 keys) with Rod | $4 50 |

# Pocket Knives

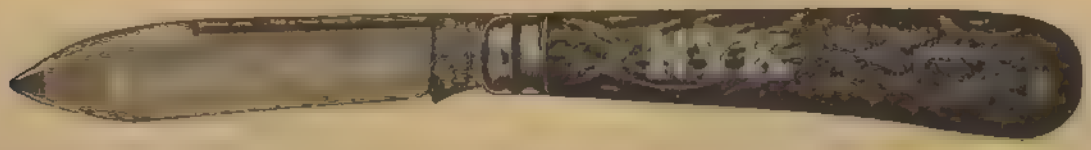
## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. — Per Doz.
**103** Cocobolo Handle, 2⅝ in., steel lined, steel bolster, one blade . . . . . $2.50

No. — Per Doz.
**1506** Bone Handle, 3¼ in., [illegible] steel bolster and [illegible] . . . . . $4.00

No. — Per Doz.
**1348** Cocobolo Handle, 3¼ in. [illegible] German silver bolster and [illegible] . . . . . $4.00



No. — Per Doz.
**1101** Iron Handle, japanned, 3½ in., iron lined, one blade . . . . . $4.00

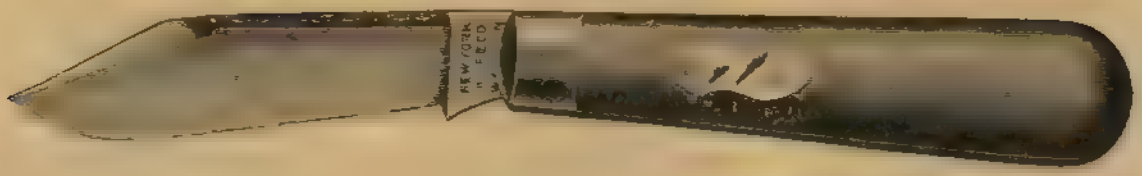
No. — Per Doz.
**106** Stag Handle, 3½ in., steel lined, steel bolster, one blade . . . . . $4.00

Put Size Cuts One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

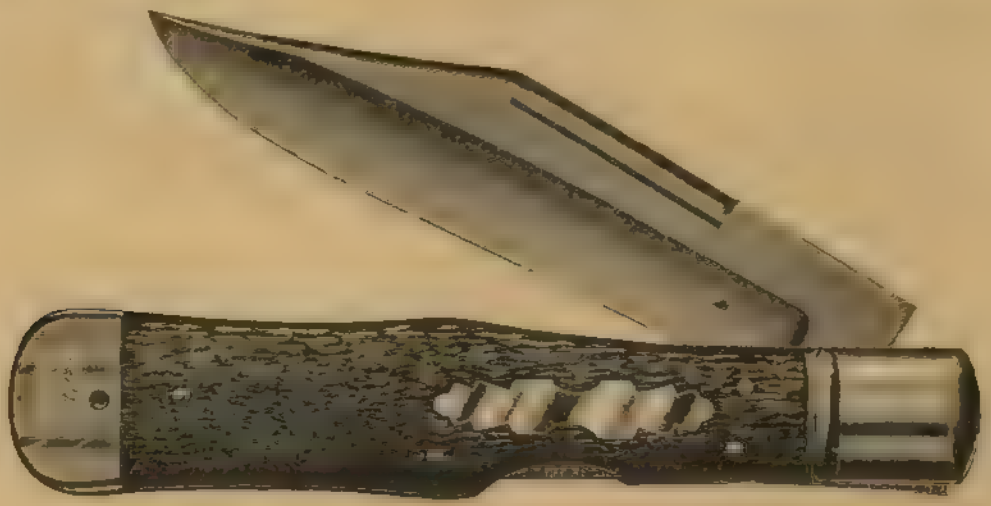
Fully Warranted



No. 1755–Cocobolo Handle, 3½ in. Handle, steel lined, steel bolster, steel blade . . . . . Per Doz. $4.00

No. 1018–Cocobolo Handle, 4 in. steel lined, steel bolster, one blade . . . . . Per Doz. $7.00

No. 188–Cocobolo Handle, 5½ in., steel lined, steel bolster, one blade . . . . . Per Doz. 13.00



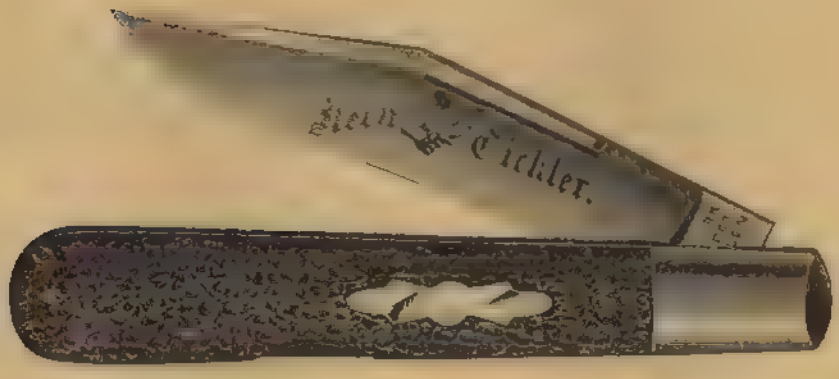
No. 187–Stag Handle, 5¼ in. brass lined, German silver liners, lock back, one blade . . . . . Per Doz. $24.00

Full Size Cuts. One-half Doz. in a Box

# Pocket Knives

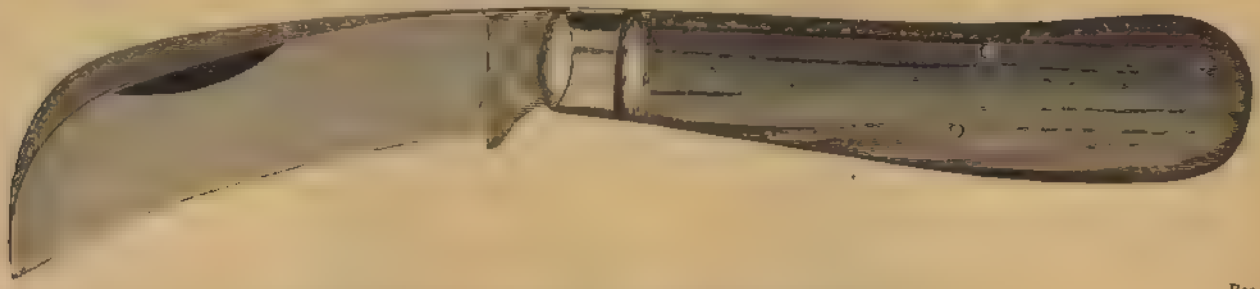
## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted



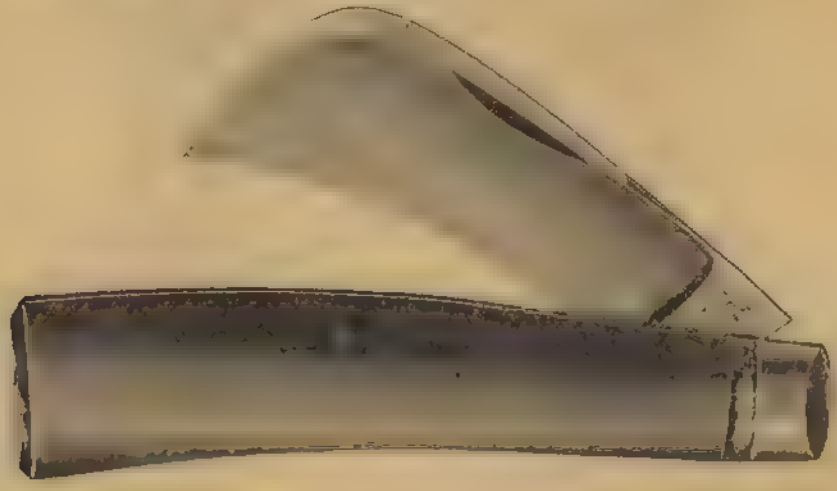
No. — Per Doz

**1665-Stag Handle** 4½ in., brass lined, German silver bolster, **lock back**, one blade . . . . $13 00



No. — Per Doz

**142 Cocobolo Handle,** 4 [illegible], Pruning Knife, steel lined, steel bolster, one blade . $8 00



No. — Per Doz

**1073-Cocobolo Handle,** 4½ in., Pruning Knife, steel lined, steel cap and bolster . . . $12.00

No. — Per Doz

**102-Stag Handle,** 4 inch, Budding Knife, steel lined. . . . . $9 00

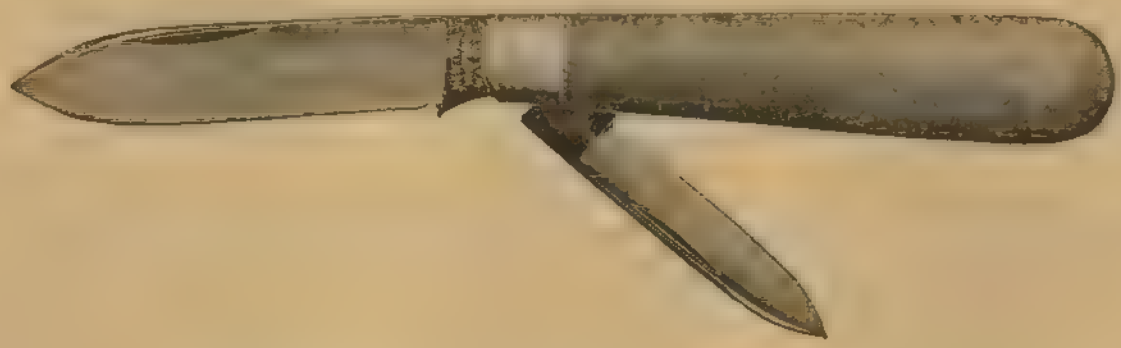
Full Size Cuts, One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. Per Doz.
225–Cocobolo Handle, 3¼ in., steel lined, steel bolster, two blade ..... $4 00
228–Ebony Handle, 3¼ in., steel lined, steel bolster, two blade ..... 4 00



No. Per Doz.
227–Ebony Handle, 3½ in., steel lined, steel bolster, two blade ..... $4 00
226–Cocobolo Handle, 3½ in., steel lined, steel bolster, two blade ..... 4 00

No. Per Doz.
209–Cocobolo Handle, 3½ in., steel lined, steel bolster, two blade ..... $4 00
224–Ebony Handle, 3½ in., steel lined, steel bolster, two blade ..... 4 00

No. Per Doz.
210–Stag Handle, steel lined, steel bolster, two blades ..... $4 50

No. Per Doz.
206–Stag Handle, 3½ in., steel lined, steel bolster, two blade ..... $4 50

Full Size Cuts, One half Dozen in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. Per Doz.
**608–Stag Handle,** 3 in., brass lined, German silver bolsters, one blade, a flexible nail file. $12.00
**609–Pearl Handle,** 3 in., brass lined, German silver bolsters, one blade, a flexible nail file 18.00

No. Per Doz.
**2060–Pearl Handle,** 2⅝ in., brass lined, German silver tipped, two blade ..... $16.00

No. Per Doz.
**277–Pearl Handle,** 2¾ in., brass lined, two blade ..... $16.00

No. Per Doz.
**2999–Pearl Handle,** 2¾ in., brass lined, German silver tipped, two blade..... 7.00

No Per Doz.
**2901–Pearl Handle,** 3⅛ in., flat model, German silver lined and milled, two blade.. ..... $24.00

No. Per Doz.
**2273–Pearl Handle,** 2⅞ in., German silver lined and milled, two blade . . . $24.00

No Per Doz.
**2279–Pearl Handle,** 3 in., German silver lined and milled two blade . . . . . $24.00

No Per Doz.
**600–Carved Pearl Handles,** 2½ in., gold plated lining, two blade ..... $12.00

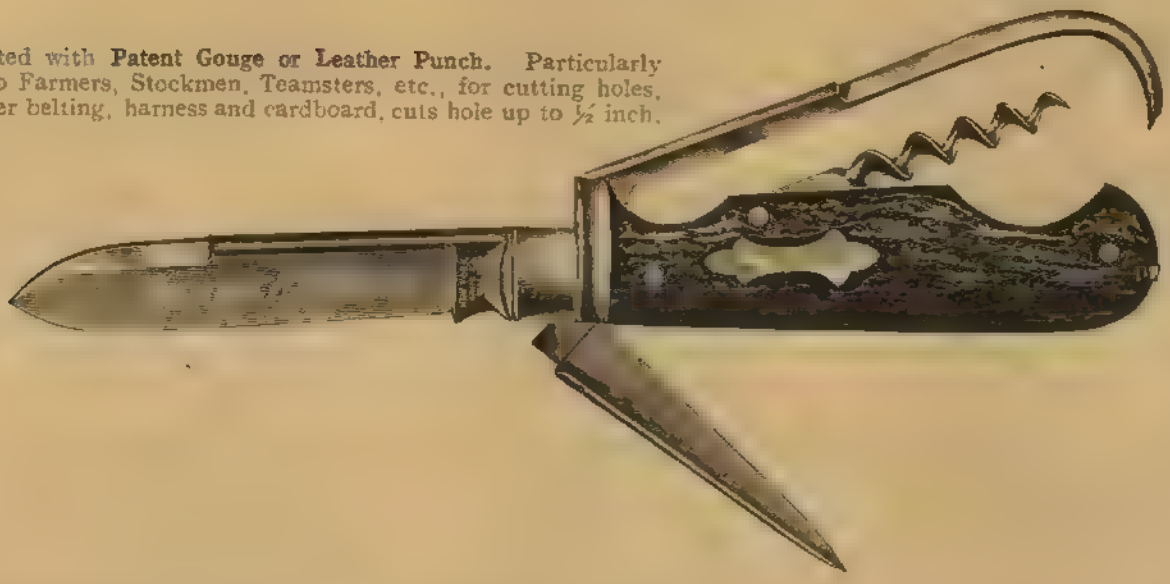
Full Size Cuts. One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

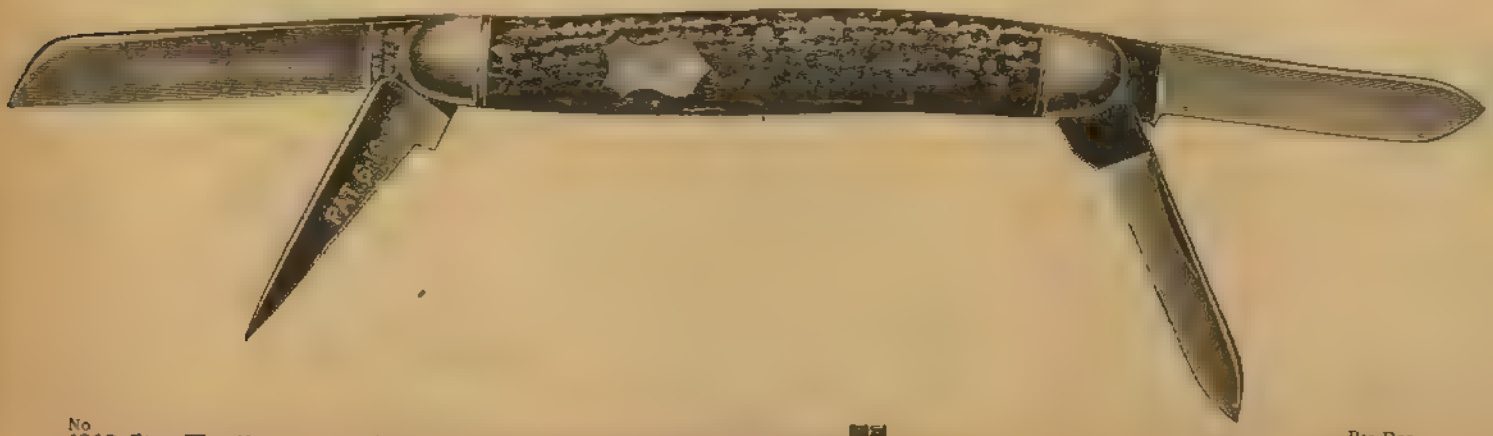
Fully Warranted

Fitted with **Patent Gouge or Leather Punch.** Particularly useful to Farmers, Stockmen, Teamsters, etc., for cutting holes, in leather belting, harness and cardboard, cuts hole up to ½ inch.



No. **41006–Genuine Stag Handle,** 3¾ in., brass lined, German silver bolster, fitted with leather punch, cork screw, screw driver, hoof cleaner and large blade. . . . . Per Doz. $42 00

No. **4230–Stag Handle,** 3½ in., brass lined, German silver bolsters, fitted with leather punch, screw driver, can opener, crown top opener and one heavy blade. . . . . Per Doz. $24.00



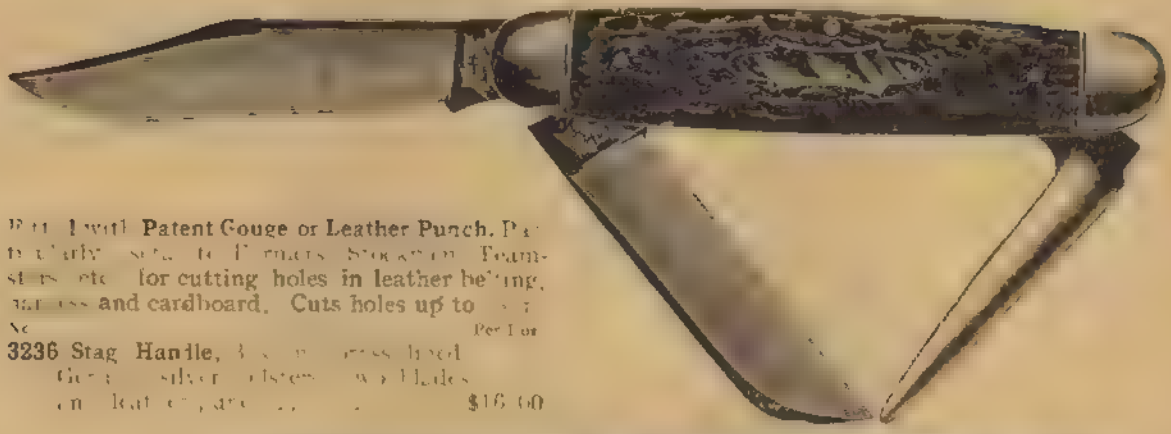
No. **4219–Stag Handle,** 3⅞ in., German silver lining and bolsters, Limag milled . . . . . Per Doz. $24 00

Full Size Cuts One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

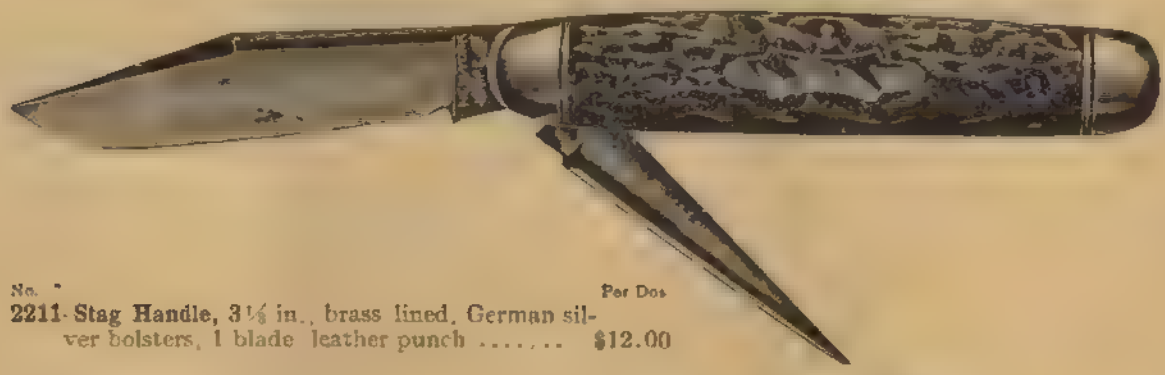
Fully Warranted



...with Patent Gouge or Leather Punch. Particularly ... to Farmers, Stockmen, Teamsters, etc., for cutting holes in leather belting, harness and cardboard. Cuts holes up to ...

No. Per Doz.

3236 Stag Handle, ... brass lined, German silver bolsters, ... Blades, ... leather punch, ... $16.00

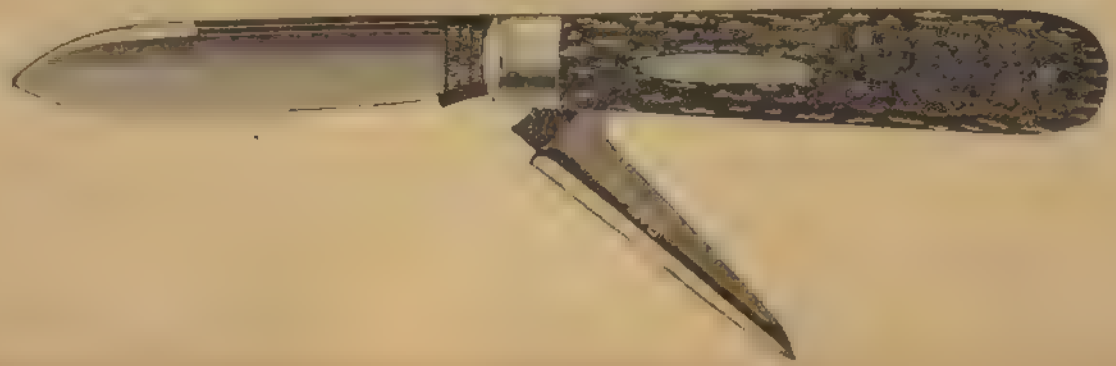


No. Per Doz.

2211 Stag Handle, 3½ in., brass lined, German silver bolsters, 1 blade leather punch ..... $12.00

No.

6016 Stag Handle, ... in. Auto Knife, brass lined, ... bolsters, with ... $12.00



No.

6443 Stag Handle, 3½ in., steel lined, steel bolster, one blade and leather punch ... $8.00

Full Size Cuts. One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. 331-Stag Handle, [illegible] Per Doz. $13 00

No. 3208–Stag Handle, [illegible] Per Doz. $15 00

No 3224–Stag Handle, [illegible] Per Doz. $15.00

No 3220–Stag Handle, [illegible], German silver bolsters, three blade Per Doz. $15 00

Full Size Cuts One-half Doz. in a Box

# Coffee Mills

PARKERS CANISTER

| No. | | Per Doz. |
|---|---|---|
| 443 | Japanned Case, Glass Front, with Cup | $ 8.75 |

One-half Doz. in a Case. Weight, 30 pounds

EAGLE CANISTER

| No. | | Per Doz. |
|---|---|---|
| 444 | Grinders and Steels Made of hard Chilled Iron | $ 8.25 |

One-half Doz. in a Case. Weight 30 pounds

PARKERS SIDE

| No. | Size Hopper | Shipping Weight, Box | Per Doz. |
|---|---|---|---|
| 50 | 1⅛x3½x4 in. | 40 lbs | $7.50 |
| 60 | 2 x3¾x4½ in. | 50 lbs | 8.50 |
| 70 | 2 x4 x5½ in. | 55 lbs | 10 00 |
| 80 | 2¾x5 x6¼ in. | 70 lbs | 16 00 |
| 90 | 2¾x6¾x9½ in. | 110 lbs | 26.00 |

One half Doz in a Box

| No. | Size Hopper | Per Doz. |
|---|---|---|
| 1360 | 1⅛x4¾x4½ in | $ 5.00 |

One Doz in a Box. Weight, 34 pounds

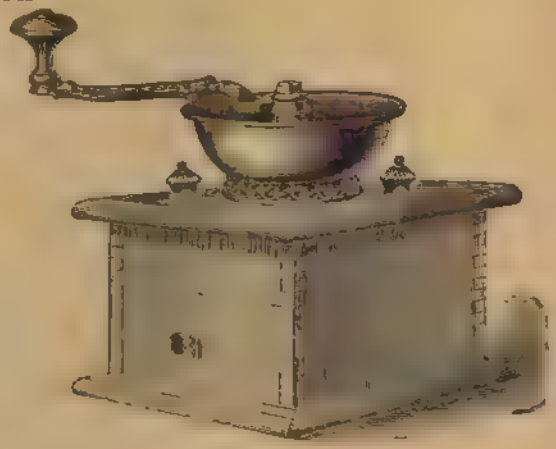
# Coffee Mills

## MONITOR

No. — Per Doz.
**104**–Bottom and Body Drawn from One piece of Sheet Steel, Black Japan Finish . . . . . $ 5 00
One-half Doz. in a Box

## PARKERS BOX

No. Size Box — Per Doz.
**1180**–4⅝x1⅝x2¾ in. Low Hopper . . . . . $ 5.50
One-half Doz. in a Box. Weight, 38 pounds Doz.



No. Size Box — Per Doz.
**316**–5x5x3⅛ in. Retinned Hopper . . . . . $10 00
One-half Doz. in a Box. Weight 46 pounds Doz.

No. Size Box — Per Doz.
**401**–5x5x4¼ in. Med. Size Hopper . . . . . $13.00
**402**–5x5x4¼ in. Large Size Hopper . . . . . 14.00
Weight No. 401, 82 pounds. 402, 90 pounds per Doz. One-half Doz. in a Box

No. Size Box — Per Doz.
**1400** 4½x4¼x4¼ in . . . . . $11 50
One-half Doz. in a Box. Weight 55 pounds Doz

# Coffee Mills

## PARKERS BALL BEARING

No. 035

No. 045

| No. | | Each |
|---|---|---|
| 035– 9 | in. High Capacity of Hopper 4 oz. Grinds 6 oz. per Minute, Weight 6 lbs | $ 2.50 |
| 045–11½ | in. High, Capacity of Hopper 4 oz. Grinds 6 oz. per Minute, Weight 6 lbs | 3.00 |

Packed Six in a Crate

No. 200

No. 300

No. 500

| No. | | Each |
|---|---|---|
| 200–12½ | in. High Capacity of Hopper 4 oz Grinds 6 oz. per Minute, Fly Wheel 9 in Diam. Wt. 20 lbs | $ 6.00 |
| 300–15 | in. High, Capacity of Hopper 8 oz. Grinds 8 oz. per Minute, Fly Wheel 11 in. Diam. Wt. 23 lbs | 9 00 |
| 500–17 | in. High, Capacity of Hopper 1 lb. Grinds 12 oz. per Minute, Fly Wheel 12½ in. Diam. Wt 36 lbs. | 14.00 |

Packed One in a Crate

No. 700

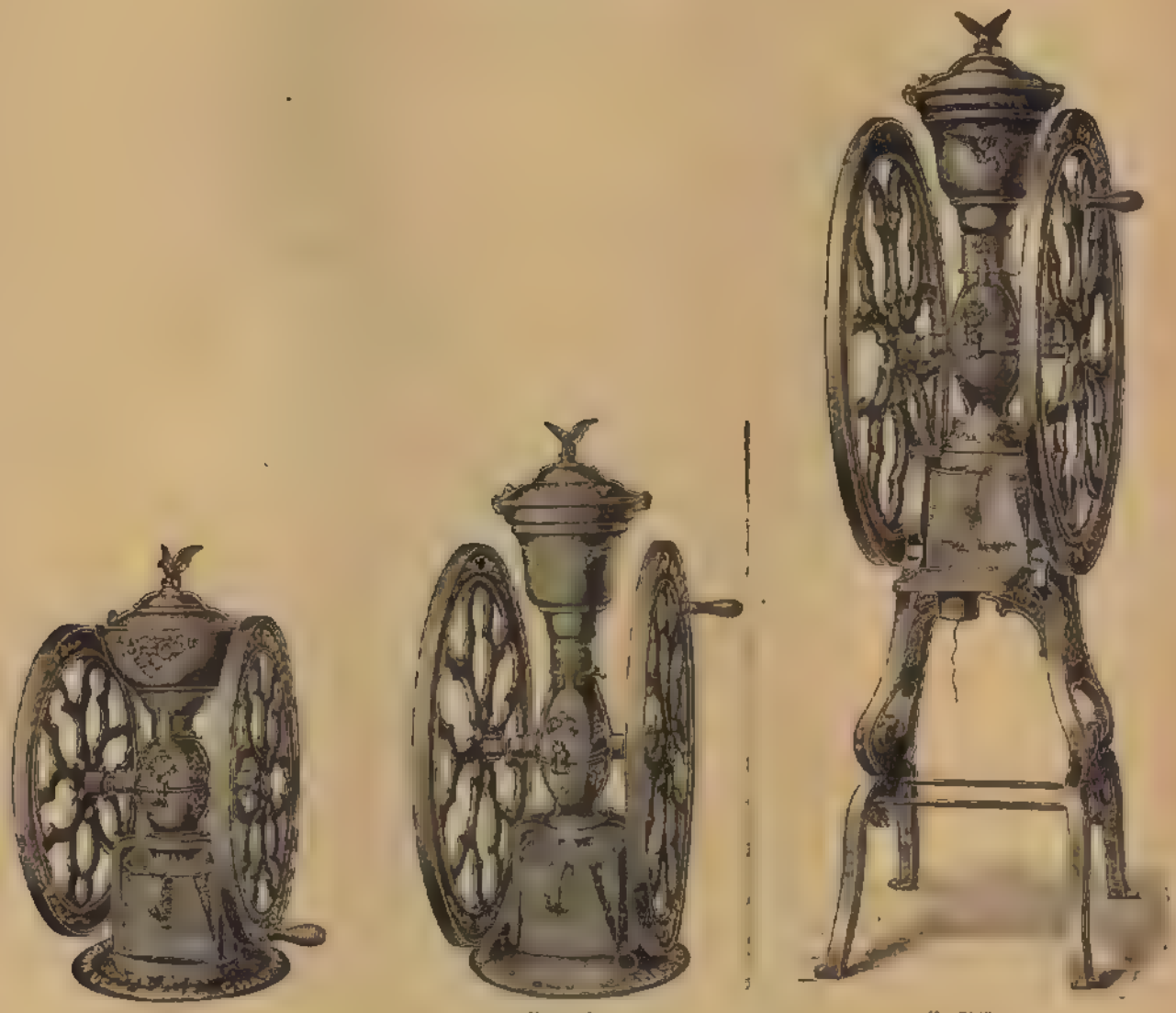
No. 900

| No | | Each |
|---|---|---|
| 700–24 | in. High, Capacity, Hopper 1¼ lbs. Grinds 1 lbs. per Minute, Fly Wheel 17 in. Diam. Wt. 62 lbs. | $18 00 |
| 900–27 | in. High, Capacity, Hopper 3 lbs. Grinds 1½ lbs per Minute, Fly Wheel 19½ in. Diam. Wt. 107 lbs. | 25.00 |

Packed One in a Crate

# Coffee and Spice Mills

## PARKERS BALL BEARING



No. 2120 No. 2160

Iron Hoppers, Painted Vermillion, Gold Stripped

| No. | | Each |
|---|---|---|
| **1200** | 33 in. High, Capacity of Hopper 6 lbs Grinds 1½ lbs. per Minute, Wheels 25½ in Diam Wt. 140 lbs | $35.00 |

Packed One in a Crate

| No. | | Each |
|---|---|---|
| **2120–** | 43 in. High, Capacity of Hopper 6½ lbs. Grinds 1½ lbs. per Minute, Fly Wheels 31 in. Diam Wt. 200 lbs | $40.00 |

Packed in Two Crates

| No. | | Each |
|---|---|---|
| **2160–** | 5 ft. 8 in. High, Grinds 1½ lbs per Minute, Fly Wheel 36 in. Diam. Wt. 285 lbs. has a Cast Iron Package Shelf and Twine Holder, An open work Shelf with removable Waste Pan beneath which Catches all loose Grounds **that do not fall into the receptacle** ... | $55.00 |

Above Mill (2160) Can be furnished from Factory fitted for Power, without extra Cost.

Packed in Two Crates

# Pocket Knife Purses

**Kid, Chamois Lined, With Glove Snap**

| No. | Per Doz. |
|---|---|
| 2–Sizes 1, 2, 3, 4, 5 and 6 | $ 2 00 |

One quarter Gross in a Box

# Hunting Knives

**Deer Foot, Lock Back**

| No. | Per Doz. |
|---|---|
| 8377–3½ in. Clip Blade | $18.00 |

**Deer Foot, Lock Back, With Cork Screw**

| No. | Per Doz. |
|---|---|
| 6488½–3¼ in. Clip Blade | $30.00 |

Above Knives, One-half Doz. in a Box

# Hunting Knives

## MARBLE'S SAFETY POCKET

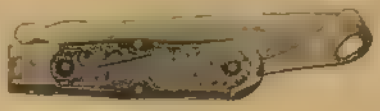
No. 83 Open

No. 83 Closed

Checked Hard Rubber Handle, With Belt Sheath

| No. | Per Doz. |
|---|---|
| 83–4½ in. Blade, Weight 4¼ oz. | $36.00 |

No. 85 Open



No. 85 Closed

Fancy Hard Rubber Handle, With Belt Sheath

| No. | Per Doz. |
|---|---|
| 85–5 in. Blade, Weight 6 oz. | $48.00 |

## MARBLE IDEAL

No. 45

Laminated Leather Handle, Tube Sheath With Each Knife

| Length Blade | Per Doz. |
|---|---|
| 5 in. | $27.00 |
| 6 in. | 30.00 |
| 7 in. | 33.00 |

No. 46

Genuine Stag Handle, With Shield
Tube Sheath With Each Knife

| Length Blade | Per Doz. |
|---|---|
| 6 in. | $36.00 |

## MARBLE SAFETY CARVER

No. 76—Open

No. 76 Closed

| No. | Per Doz. |
|---|---|
| 76–8 in. Blade | $12.00 |

## J. RUSSELL

Extra Heavy Hand Forged Blade, Genuine Scored Ebony Handle, With Tube Sheath

| No. | Per Doz. |
|---|---|
| 32 5 in. Blade | $36.00 |
| 33 6 in. Blade | 42.00 |

# Hunting Knives

Nos. 349 and 002

**Heavy Hand Forged Blade, Genuine Stag Handle, With Russet Leather Sheath**

| No. | Length Blade | Per Doz |
|---|---|---|
| 349 | 5 in | $13.00 |
| 349 | 6 in | 15 00 |
| 349 | 7 in | 19 00 |

**Extra Heavy Hand Forged Blade, Genuine Stag Handle, With Russet Leather Sheath**

| No. | Length Blade | Per Doz. |
|---|---|---|
| 002 | 6 in. | $20 00 |
| 002 | 7 in. | 26 00 |

| No. | | Per Doz |
|---|---|---|
| 1167 | 4½ in. Blade, Pearl Handle German Silver Ferrule and Hilt, Leather Sheath | 24.00 |

| No. | | Per Doz |
|---|---|---|
| 1182 | 4½ in. Blade, Ivory Handle, German Silver Ferrule and Hilt, Leather Sheath | 14 00 |

# Sheaths

HATCHET

Russet Leather Hatchet Sheath

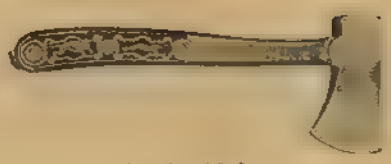
| No | Per Doz. |
|---|---|
| 561 | $ 7.00 |

KNIFE

Russet Leather, Sewed Knife Sheath

| No. | Per Doz |
|---|---|
| 565-5, 6, 7 | $ 3.00 |

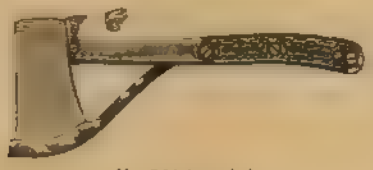
# Marble Safety Axes



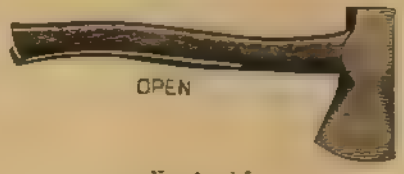
Nos. 1 and 3 Open

| No. | | Per Doz. |
|---|---|---|
| 1 | **Tomahawk Blade,** Weight 16 oz., Length 10 in., Rubber Handles.. | $30 00 |
| 3 | **Tomahawk Blade,** Weight 27 oz., Length 12 in., Rubber Handles.. | 36.00 |

| No. | | Per Doz. |
|---|---|---|
| 2 | **Axe Blade,** Weight 20 oz., Length 11 in., Rubber Handles | $30.00 |



No. 2½-Guarded




Nos. 4 and 5

| No. | | Per Doz. |
|---|---|---|
| 2½ | **Tomahawk Blade,** (Same as No. 2) With Folding Nail Claw | $33.00 |
| 4 | **Tomahawk Blade,** Weight 24 oz., Length 12 in., Hickory Handles. | 21 00 |
| 5 | **Tomahawk Blade,** Weight 16 oz., Length 11 in., Hickory Handles. | 18.00 |

Above Packed One sixth Doz. in a Box

# Match Box

MARBLES SAFETY WATERPROOF

| No. | | Per Doz. |
|---|---|---|
| 181 | **Marble Nickel Plated, Waterproof Match Box** | $ 6.00 |

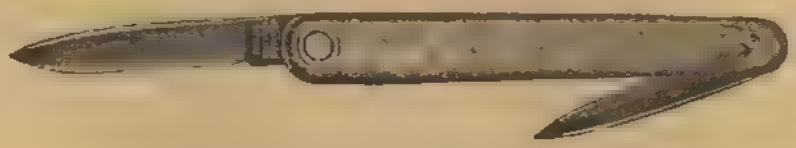
Packed One-half Doz. in a Box

# Pocket Knives

## PRESS BUTTON

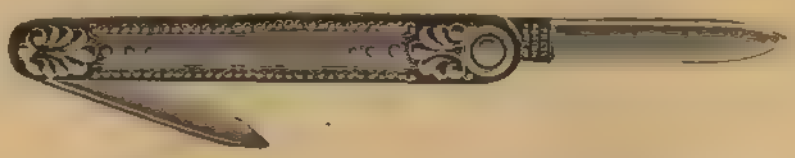
Two Blade, Crocus Polished, Brass Lined, German Silver Bolsters

| No. | | Per Doz. |
|---|---|---|
| 5515–2⅞ in. | Stag Handle | $13.00 |



Crocus Polished, Brass Lined, No Bolsters

| No. | | Per Doz. |
|---|---|---|
| 5575–2⅞ in. | Pearl Handle, Two Pen Blades | $24 00 |
| 5551–2⅞ in. | Stag Handle, One Pen and One File Blade | 12 00 |



Two Blade, Crocus Polished, One Pen and One File, German Silver Lined

| No. | | Per Doz. |
|---|---|---|
| 5565–2⅞ in. | Fancy German Silver Handle | $12.00 |

Two Blade, Crocus Polished, One Pen and One File Blade, German Silver Lined

| No. | | Per Doz. |
|---|---|---|
| 5555–2⅞ in. | Fancy Sterling Silver Handle | $24 00 |

Two Blade, Crocus Polished, One Pen and One File, German Silver Lined

| No. | | Per Doz |
|---|---|---|
| 5560–3⅛ in. | Fancy German Silver Handle | $12.00 |

Put Sets Cut One half Dozen in a Box

# Pocket Knives

## PRESS BUTTON

Two Blade, Crocus Polished, One Pen and One File, German Silver Lined

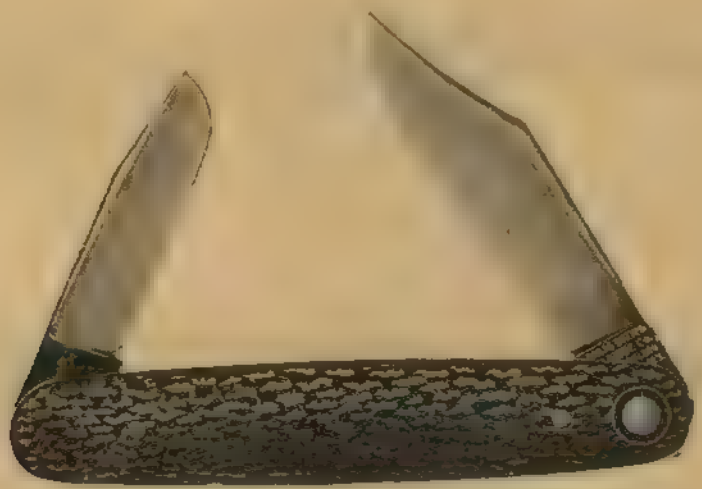
| No. | | Per Doz |
|---|---|---|
| 5550–3¼ in. | Fancy Sterling Silver Handle | $27.00 |

Two Blade, Crocus Polished, Pen, Brass Lined

| No. | | Per Doz. |
|---|---|---|
| 5570–3⅛ in | Pearl Handle | $30.00 |

Two Blade, Crocus Polished, Pen, Brass Lined

| No. | | Per Doz. |
|---|---|---|
| 5510–3 3/10 in. | Stag Handle | $12.00 |



Two Blade, Crocus Polished, Clip and Spaying, Brass Lined

| No. | | Per Doz. |
|---|---|---|
| 115–3¼ in. | Stag Handle | $14.00 |

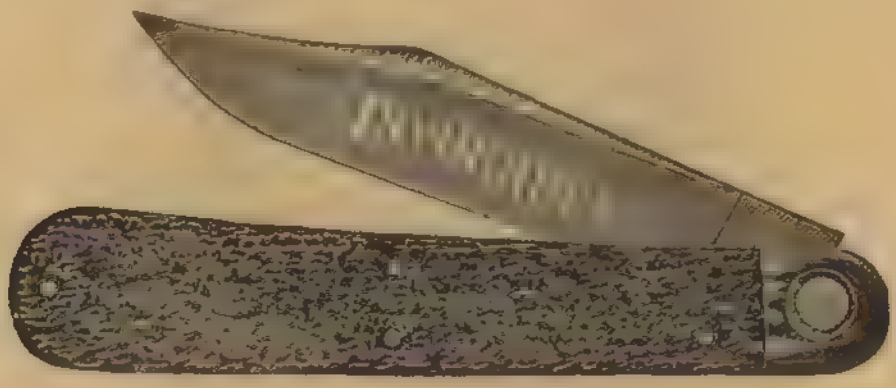
Full Size Cuts, One-half Doz in a Box

# Pocket Knives

## PRESS BUTTON

One Blade, Half Crocus Polished, Iron Lined, German Silver Bolster

| No. | | Per Doz. |
|---|---|---|
| 5010 | 4 in. Stag Handle | $12.00 |



One Blade, Half Crocus Polished, Iron Lined, German Silver Bolster

| No. | | Per Doz. |
|---|---|---|
| 5000 | 5 in. Stag Handle | $14.00 |

One Blade, Half Crocus Polished, Iron Lined, German Silver Bolster With Guard

| No. | | Per Doz. |
|---|---|---|
| 5005 | 5 in. Stag Handle | $18.00 |

Packed One in a Box

## Combination Knife

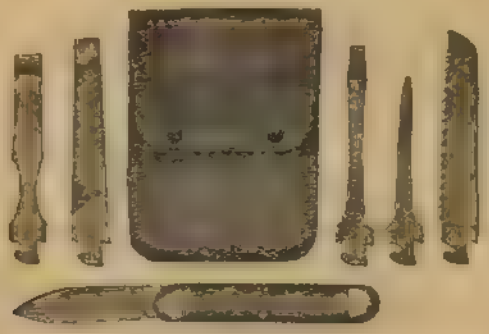
H. H. H

Contains Leather Punch, Swedging Awl, Wire Cutter, Wire Pliers, Alligator Wrench, Hoof Hook, Screw Driver, Screw Bit and Cutting Blade

| No. | Per Doz. |
|---|---|
| HHH-Stag Handle | $21.00 |

One Each in a Box

## Combination Tool Kits



Contains Pocket Knife, Saw, Chisel, Screw Driver, File and Awl, Packed in Leather Case, all Tools Adjustable to Knife

| No. | Per Doz. Kits |
|---|---|
| 1823 | $26.00 |

Contains in Addition to Tools in No. 1823, Hammer, Can-Opener and Rule, in Folding Leather Case

| No. | Per Doz. Kits |
|---|---|
| 1810 | $42 00 |

One Each of Above Sets in a Box

# Miscellaneous Appliances

## UNION LIGHTNING ARRESTER

Serves as a Peg Cut-out Lightning Arrester and Ground Switch. An excellent and cheap form for short lines.

| No. | | Each |
|---|---|---|
| 749 | —With Pin, complete | $0 90 |

## STRAP KEY

Signal Strap Key

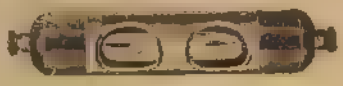
| No. | | Each |
|---|---|---|
| 1591 | —Open Circuit | $0 70 |
| 1592 | —Closed Circuit | 70 |
| 1593 | —Double Circuit | 80 |

## AUTOMATIC THERMOSTAT

This Thermostat is adjustable to any degree of heat, but when not otherwise ordered is set at 125° Fahrenheit

| No. | | Each |
|---|---|---|
| 1653 | —Automatic Thermostat | $0 90 |

## POLARITY INDICATOR

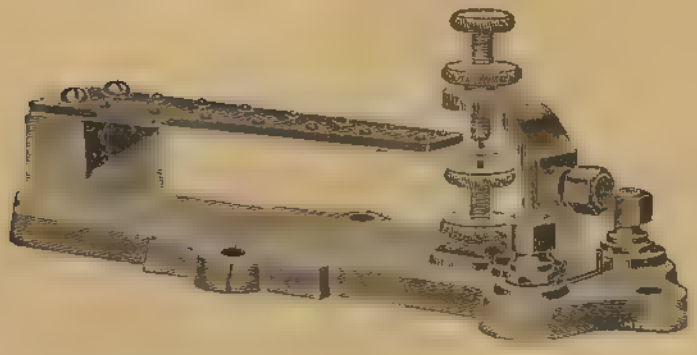


Size 3½x1 in.

Will indicate instantly the negative and positive poles when connected in circuit. Nickel Plated shell protects glass tube.

| No. | | Each |
|---|---|---|
| 3320 | —For use with Battery | $1 75 |
| 3321 | —For 50 to 600 Volts | 1 75 |

## ADJUSTABLE THERMOSTAT



This Thermostat can be set for any degree of heat or cold, and will make electrical contact on the rise and fall of the temperature.

Used for fire alarm, hot houses, incubators and many other places where uniform temperature is required.

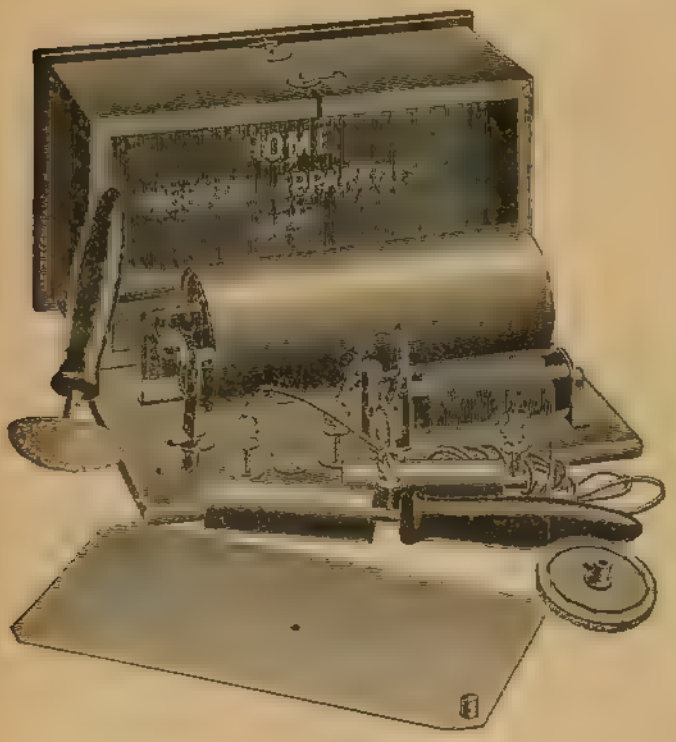
| No. | | Each |
|---|---|---|
| 1673 | —Adjustable Thermostat | $1 75 |

## FIRE ALARM BOX

Used in hotels and factories to give notice in case of fire. All that is necessary is to break the glass with the hammer. The contact spring is then released, closing the circuit and giving the signal at some central point.

| No. | | Each |
|---|---|---|
| 1652 | —Fire Alarm Box | $1 00 |

# Medical Batteries



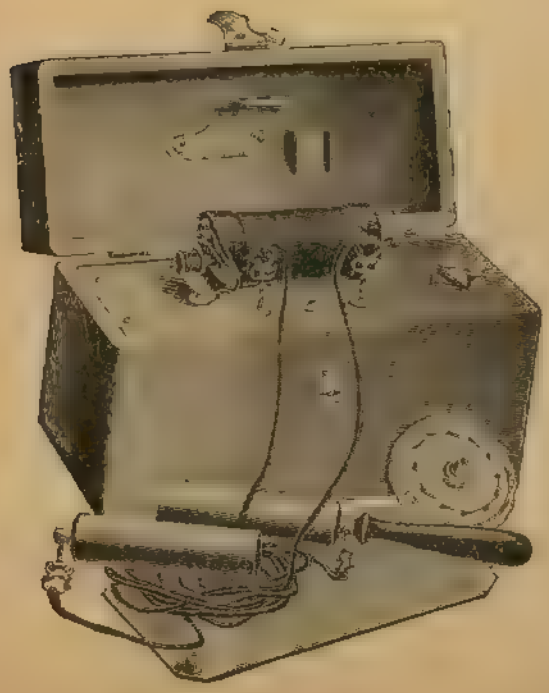
No. 4 Home Battery

## HOME MEDICAL BATTERY

The unusually complete and excellent set of Electrodes furnished with this instrument make it very convenient in a great variety of applications for the patient with or without assistance; for instance, in the use of two sponge Electrodes, one in each hand, or having one of them clasped against any part of the body by means of an elastic, while the other, attached to its insulating handle, can be applied wherever desired, or, when foot plate is used and the sponge Electrode applied from the other Pole of the Battery, and a great many other combinations which would naturally suggest themselves from the fact of having the Electrodes with which to make them.

Cut shows the case open at lower Compartment, showing the entire apparatus with Battery, Coil and Electrodes complete.

| No. | | Each |
|---|---|---|
| 2204 | —No. 4 Apparatus with Battery and Electrodes complete | $10 00 |



Anti Doc Battery

## ANTI-DOC MEDICAL APPARATUS

The most Compact, Reliable, Durable and Neatest Medical Apparatus made. The armature and vibrating parts are an entirely new design and so arranged that perfect adjustment is always maintained. The frame for holding the adjusting contact screw and armature is made from one piece of metal and is securely fastened to the base holding the coil and to the end of the induction coil, thus insuring permanency of position for all the parts. A recording scale is attached to the base to show the strength of current in operation.

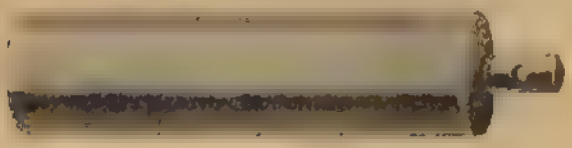
Will generate a current as powerful and steady as any one cell apparatus manufactured. Three currents are furnished, viz.: Primary, Secondary and Primary and Secondary Combined.

The following Electrodes are included: Two Metallic Hand Electrodes, one improved Sponge Electrode, one Nickel Plated Foot Plate, one Electrode Handle for Sponge or Hand Electrode, one pair Silk Conducting cords, with tips; also a hand book of directions for home treatment with each apparatus.

| No. | | Each |
|---|---|---|
| 2215 | —Apparatus with Battery and Electrodes complete | $4 50 |

# Medical Battery Electrodes

## CYLINDER HAND ELECTRODES



No. 2371

Sufficiently small to go into No. 2370.

| No. | | Per Pair |
|---|---|---|
| 2371 | —Nickel Plated | $0 80 |

No. 2370

Intended for use with Interchangeable Handle.

| No. | | Per Pair |
|---|---|---|
| 2370 | | $0 80 |

## INTERCHANGEABLE ELECTRODE HANDLE

For use with Cylinder No. 2370 and Sponge Electrode.

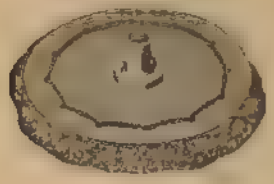
| No. | | Each |
|---|---|---|
| 2365 | – Electrode | $0 35 |

## HAIR BRUSH ELECTRODE

This Electrode furnishes the means of applying currents of electricity to the head and roots of the hair.

| No. | | Each |
|---|---|---|
| 2355 | Hair Brush Electrode, complete | $3 00 |

## SPONGE ELECTRODE



Metal parts Nickel Plated. Fits the interchangeable handles. Good quality sponge. Well fastened.

| No. | | Each |
|---|---|---|
| 2373 | | $0 48 |

## MEDICAL BATTERY CORDS

One red and one green cord silk braid over wires with Plated Tips, strong and serviceable.

| No. | | Per Pair |
|---|---|---|
| 2358 | —Cords 3 feet long | $0 80 |
| 2362 | —Cords 4 feet long | 1 00 |

## HORSESHOE MAGNETS

| No. | Length, in. | Per Doz. |
|---|---|---|
| 4975 | –2 | $1 50 |
| 4976 | 2½ | 1 75 |
| 4977 | —3 | 2 00 |
| 4978 | —3½ | 2 75 |
| 4979 | 4 | $3 50 |
| 4980 | —5 | 5 50 |
| 4981 | 6 | 7 50 |
| 4982 | 7 | 9 50 |

# Spark Coils

| No. | | Each |
|---|---|---|
| 2A— | 8 in. long, Gas lighting Coil | $ 1 42 |
| 3A | 10 in. long, Gas lighting Coil | 1 82 |
| 4A— | 12 in. long, Gas lighting Coil | 2 24 |
| 7A— | 10 in. long, Gas Engine Coil | 2 44 |
| 8A | 12 in. long, Gas Engine Coil | 3 02 |

## WEATHERPROOF GAS ENGINE COILS

| No. | | Each |
|---|---|---|
| WP7A— | 10 in. long | $2 64 |
| WP8A— | 12 in. long | 3 22 |

## EDISON PRIMARY COILS

| No. | | Each |
|---|---|---|
| 27A— | Edison Type, 14 layers of No. 13 Wire | $3 08 |
| 27B— | Edison Type, 12 layers of No. 13 Wire | 2 78 |

## "QUICK ACTION" JUMP SPARK COILS

With Vibrator. Oak Case.

| No. | | Each |
|---|---|---|
| QA1— | Single Cylinder | $ 8 50 |
| QA2— | Double Cylinder | 17 00 |

# "Chicago" Coils

**For Jump Spark Ignition, with Vibrator**

Single Coil No. C1

Showing Single Coil disassembled.

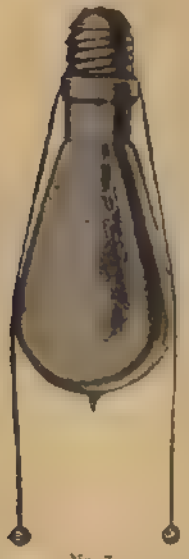
| No. | Description | Weight | Height | Depth | Width | Each |
|---|---|---|---|---|---|---|
| C1— | Single Coil | 2½ lbs. | 4⅛ in. | 7 in. | 3½ in. | $ 6 00 |
| C2— | Double Coil | 4¼ lbs. | 4⅛ in. | 7 in. | 5½ in. | 13 00 |
| C3— | Triple Coil | 6¾ lbs. | 4⅛ in. | 7 in. | 7½ in. | 19 00 |
| C4— | Quadruple Coil | 8¾ lbs. | 4⅛ in. | 7 in. | 9½ in. | 25 00 |

## RENEWAL PARTS FOR ABOVE "CHICAGO" COILS

| | Each |
|---|---|
| Condenser Cartridge | $ 1 00 |
| Secondary Cartridge | 2 50 |
| Adjustment Screw with Iridium Platinum Contact | 80 |
| Vibrator Spring, with Iridium Platinum Contact | 90 |

# Turn-Down Incandescent Lamps

EDISON BASE



No. 7
"Hylo" Pull String

No. 1
"Economical" Pull String

No. 2
"Economical" Turn Bulb

A Lamp which will give either a 16 Candle Power or a 1 Candle Power or vice versa, without any waste of current. As easily turned on as a gas jet. These Lamps are of the same size as an ordinary Incandescent Lamp and fit into the fixture the same way. The Lamp when turned down saves five sixths of the current an ordinary Lamp would use. It also lasts as long as three ordinary Lamps.

## NO. 7—"HYLO" PULL STRING LAMPS

Provided with Strings, which turn the light up or down and out.

| Candle Power | Volts | Less than 100, Each | 100 or less than 250, Each | 250 and over, Each |
|---|---|---|---|---|
| 16 x 1 | 104 | $ 0 95 | $ 0 90 | $ 0 85 |
| 16 x 1 | 110 | 95 | 90 | 85 |
| 16 x 1 | 115 | 95 | 90 | 85 |
| 16 x 1 | 120 | 95 | 90 | 85 |
| 16 x 1 | 220 | 1 05 | 1 00 | 95 |

## No. 1—"ECONOMICAL" PULL STRING LAMPS

Provided with Strings, which turn the light up or down.

| Candle Power | Volts | Less than 100, Each | 100 or less than 250, Each | 250 and over, Each |
|---|---|---|---|---|
| 16 x 1 | 104 | $ 0 91 | $ 0 86 | $ 0 81 |
| 16 x 1 | 110 | 91 | 86 | 81 |
| 16 x 1 | 115 | 91 | 86 | 81 |
| 16 x 1 | 120 | 91 | 86 | 81 |
| 16 x 1 | 220 | 1 01 | 96 | 91 |

## No. 2—"ECONOMICAL" TURN BULB LAMPS

By turning the Bulb to the right a 16 Candle Power Light is obtained to the left a 1 Candle Power Light

| Candle Power | Volts | Less than 100, Each | 100 or less than 250, Each | 250 and over, Each |
|---|---|---|---|---|
| 16 x 1 | 104 | $ 0 91 | $ 0 86 | $ 0 81 |
| 16 x 1 | 110 | 91 | 86 | 81 |
| 16 x 1 | 115 | 91 | 86 | 81 |
| 16 x 1 | 120 | 91 | 86 | 81 |
| 16 x 1 | 220 | 1 01 | 96 | 91 |

In ordering Lamps [illegible] Voltage wanted.

# Candelabra Base Incandescent Lamps

Style A

Style B and B2

Style D

Style E

## CANDELABRA TYPE—STYLE A

| Candle Power | Volts | Total Watts | Dimensions Diam. | Length | Std Pkg | Clear Each | Frosted Each |
|---|---|---|---|---|---|---|---|
| 4 | 25 to 30 | 15 2 | $1\frac{7}{16}$ in | $3\frac{1}{16}$ in | 200 | $0 56 | $0 60 |
| 8 | 70 to 130 | 30 4 | $1\frac{7}{16}$ in. | $5\frac{1}{16}$ in. | 200 | 56 | 60 |

## CANDELABRA TYPE—STYLE B

| Candle Power | Volts | Total Watts | Dimensions Diam. | Length | Std Pkg. | Clear Each | Frosted Each |
|---|---|---|---|---|---|---|---|
| | 25 to 32 | 15 2 | 1 in. | $3\frac{1}{16}$ in | 200 | $0 56 | $0 60 |
| | 70 to 130 | 30 4 | $1\frac{5}{16}$ in. | 4 in. | 200 | 56 | 60 |

## CANDELABRA TYPE—STYLE B2

| Candle Power | Volts | Total Watts | Dimensions Diam. | Length | Std Pkg. | Clear Each | Frosted Each |
|---|---|---|---|---|---|---|---|
| 4 | 25 to 32 | 15 2 | $1\frac{5}{16}$ in. | 4 in. | 200 | $0 56 | $0 60 |
| 8 | 70 to 130 | 30 4 | $1\frac{5}{16}$ in. | 4 in. | 200 | 56 | 60 |

## CANDELABRA TYPE—STYLE D

| Candle Power | Volts | Total Watts | Dimensions Diam. | Length | Std Pkg. | Clear Each | Frosted Each |
|---|---|---|---|---|---|---|---|
| 4 | 25 to 30 | 15 2 | 1 in. | $3\frac{5}{16}$ in | 200 | $0 66 | $0 70 |
| 8 | 70 to 130 | 30 4 | $1\frac{1}{4}$ in. | $3\frac{5}{16}$ in. | 200 | 66 | 70 |

## CANDELABRA TYPE—STYLE E

| Candle Power | Volts | Total Watts | Dimensions Diam. | Length | Std Pkg. | Clear Each | Frosted Each |
|---|---|---|---|---|---|---|---|
| 4 | 25 to 30 | 15 2 | $\frac{3}{4}$ in. | $3\frac{1}{16}$ in. | 200 | $0 56 | $0 60 |
| 8 | 70 to 130 | 30 4 | $\frac{3}{4}$ in. | $3\frac{1}{16}$ in. | 200 | 56 | 60 |

In ordering Lamps, always specify the exact Voltage wanted

# Miniature Base Incandescent Lamps

Style F

Style G

Style H

Style J

## MINIATURE DECORATIVE TYPE—STYLE F

| Candle Power | Volts | Total Watts | Dimensions Diam. | Length | Std. Pkg. | Clear Each | Frosted Each |
|---|---|---|---|---|---|---|---|
| 4 | 70 to 130 | 19.4 | $1\frac{9}{16}$ in. | $3\frac{1}{4}$ in. | .200 | $0 50 | $0 54 |
| 8 | 70 to 130 | 30.4 | $1\frac{9}{16}$ in. | $3\frac{1}{4}$ in. | 200 | 50 | 54 |

## CANDELABRA TYPE—STYLE G

| Candle Power | Volts | Total Watts | Dimensions Diam. | Length | Std. Pkg. | Clear Each | Frosted Each |
|---|---|---|---|---|---|---|---|
| 8 | 90 to 130 | 33 12 | $2\frac{1}{8}$ in. | $3\frac{1}{16}$ in. | .200 | $0 56 | $0 60 |
| 16 | 90 to 130 | 56 00 | $2\frac{1}{8}$ in. | $3\frac{1}{16}$ in. | 200 | 56 | 60 |

## MINIATURE DECORATIVE TYPE—STYLE G

| Candle Power | Volts | Total Watts | Dimensions Diam. | Length | Std. Pkg. | Clear Each | Frosted Each |
|---|---|---|---|---|---|---|---|
| 1 | 12 to 15 | 4 5 | $1\frac{1}{4}$ in. | $1\frac{7}{8}$ in. | 200 | $0 56 | $0 60 |
| 3 | 12 to 15 | 4 0 | $1\frac{1}{4}$ in. | $2\frac{1}{8}$ in. | 200 | 56 | 60 |
| 2 | 70 to 130 | 6 5 | $1\frac{1}{4}$ in. | $2\frac{1}{8}$ in. | 200 | 56 | 60 |

## MINIATURE DECORATIVE TYPE—STYLE H

| Candle Power | Volts | Total Watts | Dimensions Diam. | Length | Std. Pkg. | Clear Each | Frosted Each |
|---|---|---|---|---|---|---|---|
| 3 | 12 to 15 | 12.0 | $1\frac{1}{8}$ in. | $2\frac{1}{4}$ in. | 200 | $0 46 | $0 50 |
| 2 | 70 to 130 | 13.0 | $1\frac{1}{8}$ in. | $2\frac{1}{2}$ in. | .200 | 46 | 50 |

## MINIATURE DECORATIVE TYPE—STYLE J

| Candle Power | Volts | Total Watts | Dimensions Diam. | Length | Std Pkg | Clear Each | Frosted Each |
|---|---|---|---|---|---|---|---|
| 4 | 40 to 32 | 15 2 | $1\frac{3}{8}$ in. | $2\frac{1}{8}$ in. | 200 | $0 46 | $0 50 |
| 6 | 40 to 32 | 18 2 | $1\frac{3}{8}$ in. | $2\frac{1}{8}$ in. | 200 | 46 | 50 |
| *6 | 46 to 60 | 21 6 | $1\frac{3}{8}$ in. | $2\frac{1}{8}$ in. | .200 | 46 | 50 |
| 2 | 70 to 130 | 13 0 | $1\frac{3}{8}$ in. | $2\frac{1}{8}$ in. | .200 | 46 | 50 |

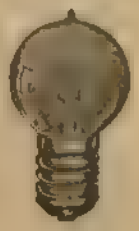
*This is the Lamp that is usually supplied for automobile service.

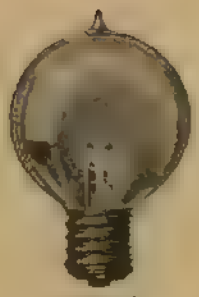
Always specify exact Voltage when ordering

# Tungsten Battery Lamps

Style G 3½

Style G 4½


Style G 5½


Style G 8

| Style | C. P. | Volts | Diam. | Shape | Base | Std. Pkg. | Price | Frosted |
|---|---|---|---|---|---|---|---|---|
| G 3½ | ½ | 1½ | 7/16 in. | Round | Miniature | 100 | $ 0 32 | $ 0 35 |
| G 3½ | 1 | 2½ | 7/16 in. | Round | Miniature | 100 | 32 | .35 |
| G 3½ | 1½ | 3½ | 7/16 in. | Round | Miniature | 100 | 32 | .35 |
| G 4½ | 1½ | 3½ | 9/16 in. | Round | Miniature | 100 | 32 | 35 |
| G 5½ | 2 | 5 | 11/16 in. | Round | Miniature | 100 | 35 | .38 |
| G 6 | 2 | 4 | 3/4 in. | Round | Miniature | 100 | 50 | 53 |
| G 6 | 2 | 6 | 3/4 in. | Round | Miniature | 100 | 50 | .53 |
| G 6 | 4 | 6 | 3/4 in. | Round | Miniature | 100 | 50 | .53 |
| G 8 | 4 | 4 | 1 in. | Round | Miniature | 100 | 50 | 53 |
| G 8 | 6 | 6 | 1 in. | Round | Miniature | 100 | 50 | 53 |
| G 8 | 8 | 8 | 1 in. | Round | Miniature | 100 | 50 | 53 |

One hundred lamps of one kind or 200 Assorted Constitute a Standard Package. Always state Candle Power and Voltage when ordering.

Style P 9

Style G 10

| Style | C. P. | Volts | Diam. | Shape | Base | Std. Pkg. | Price | Frosted |
|---|---|---|---|---|---|---|---|---|
| P 6½ | 2 | 4 | 13/16 in. | Pear | Miniature | 100 | $ 0 50 | $ 0 53 |
| P 8 | 4 | 4 | 1 in. | Pear | Miniature | 100 | 50 | .53 |
| P 8 | 4 | 6 | 1 in. | Pear | Miniature | 100 | 50 | .53 |
| P 9 | 6 | 4 | 1 1/8 in. | Pear | Candelabra | 100 | 50 | .53 |
| P 9 | 6 | 6 | 1 1/8 in. | Pear | Candelabra | 100 | 50 | 53 |
| P 12½ | 10 | 8 | 1 5/16 in. | Pear | Candelabra | 100 | 50 | 53 |
| G 10 | 6 | 6 | 1 1/4 in. | Round | Candelabra | 100 | 50 | .53 |
| G 12 | 8 | 6 | 1½ in. | Round | Candelabra | 100 | .50 | .53 |
| G 16½ | 4 | 4 | 2 1/16 in. | Round | Candelabra | 100 | 65 | .70 |
| G 16½ | 4 | 6 | 2 1/16 in. | Round | Candelabra | 100 | 65 | .70 |
| G 16½ | 4 | 8 | 2 1/16 in. | Round | Candelabra | 100 | .65 | .70 |
| G 16½ | 10 | 10 | 2 1/16 in. | Round | Candelabra | 100 | 65 | 70 |

Style G16½ can be furnished with Standard Edison Base. Always state Candle Power and Voltage when ordering.

# Weston Instruments

## PORTABLE

### Alternating Current

Carrying Case

Model 155

All of these instruments are perfectly **Dead Beat.** In fact, just as **Dead Beat** as the highest grade of Weston **Portable Direct Current Instruments.**

They are extremely sensitive and quickly and accurately respond to the most minute as well as to the greatest fluctuations in current strength, or potential difference of the circuit. All may be used on circuits of any frequency, within the limits of engineering practice of today, without sensible error in their indications. Indeed they will give practically the same indications on circuits varying in frequency from 15 cycles per second to 140 cycles per second.

The various ranges of voltmeters listed are all self-contained. They include instruments adapted to give a full scale deflection with 75 Volts, to instruments adapted to give a full scale deflection with 750 Volts. For use with higher **voltage, multipliers or transformers must be used.**

The various ranges of Ammeters listed include instruments adapted to give a full scale deflection with 1 Ampere to instruments adapted to give full scale deflection with 300 Amperes. These Ammeters may also be used on circuits having a potential difference of 2300 Volts. For higher ranges or higher voltage, transformers must be used.

When greater range or still Ammeters are required we recommend the use of the 5 Ampere instrument with a suitable transformer, the secondary of which must have a 5 ampere capacity and the ratio of transformation between primary and secondary must be such as is demanded for the measurement of the primary current. The scale of the instrument can be marked to directly indicate the strength of the current in the primary or it can be marked 5 amperes and the current in the primary calculated by multiplying the deflection by the ratio of the primary to the secondary of the transformer.

### Voltmeters Model 155

The dimensions of all Voltmeters up to and including a capacity of 300 Volts are 7 in. x 7 1/8 in. x 3 1/4 in. deep. The dimensions of Voltmeters having a range higher than 300 Volts and not greater than 750 Volts, are 7 3/8 in. x 8 3/4 x 3 1/4 in. All catalogued ranges of Voltmeters are provided with self-contained resistances.

| Range | Without Case | With Case |
|---|---|---|
| 75 Volts | $18 50 | $22 00 |
| 125 Volts | 18 50 | 22 00 |
| 150 Volts | 18 75 | 22 25 |
| 300 Volts | 22 50 | 26 00 |
| 500 Volts | 26 50 | 31 00 |
| 600 Volts | 27 50 | 32 00 |
| 750 Volts | 30 00 | 34 50 |

### Milli Ammeters

| | | |
|---|---|---|
| 75 Milli Amperes | $17 75 | $21 25 |
| 150 Milli Amperes | 17 75 | 21 25 |
| 250 Milli Amperes | 17 75 | 21 25 |
| 500 Milli Amperes | 17 75 | 22 25 |
| 750 Milli Amperes | 17 75 | 22 25 |

### Ammeters Model 155

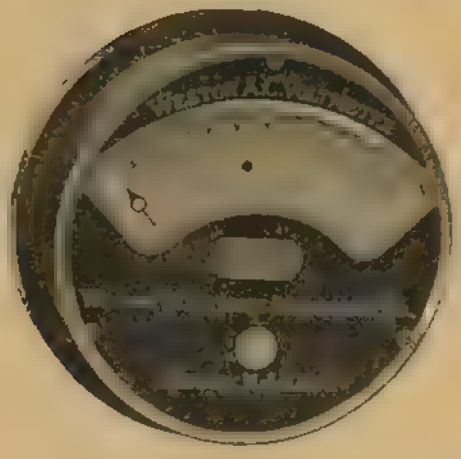
The dimensions of all the listed Ammeters and Milli Ammeters are 7 in. x 7 1/8 in. x 3 1/4 in. For the measurement of all alternating currents greater than 300 Amperes and for the measurements of currents of high potential current transformers must be used.

| Range | Without Case | With Case |
|---|---|---|
| 1 Ampere | $17 75 | $21 25 |
| 2 Amperes | 17 50 | 21 00 |
| 3 Amperes | 17 00 | 20 50 |
| 5 Amperes | 17 00 | 20 50 |
| 10 Amperes | 17 00 | 20 50 |
| 15 Amperes | 17 50 | 20 50 |
| 25 Amperes | 17 00 | 20 50 |
| 50 Amperes | 17 50 | 21 00 |
| 75 Amperes | 17 50 | 21 00 |
| 100 Amperes | 17 50 | 21 00 |
| 150 Amperes | 18 00 | 21 50 |
| 200 Amperes | 18 50 | 22 00 |
| 250 Amperes | 18 75 | 22 25 |
| 300 Amperes | 19 00 | 22 50 |

# Weston Instruments

## SWITCH BOARD

### Alternating Current



Model 151

Model 156

There are practically no errors in the indications of these instruments, for are prepared with ordinary engineering practice. They indicate the same whether left in a circuit for a minute or permanently. The errors for any reasonable change in the temperature of the surrounding atmosphere of the room in which they are used are negligible. In fact a change of 100° F will cause an error of less than ½ of 1% on a Voltmeter of 150 Volts. These instruments are perfectly **Dead Beat,** and in fact just as dead beat as the highest grade of Weston Direct Current Instruments.

Every Ammeter is tested before shipment for insulation with 1600 Volts for one minute. The case of each Ammeter is provided with a ground terminal which must be made to secure same to the switch board. This must be connected to earth when the potential difference of circuits exceeds 200 Volts. When properly erected, the Ammeters are perfectly safe for use in circuits operating at a potential difference of 2500 Volts but must be used with transformers in circuits of higher potential than this. All things considered, it is economy of first cost and a slight advantage in accuracy, in switching work not to place Ammeters in the primary circuits, owing to the fact that the switch and any device directly connected to the high potential circuits.

Transformers must be used on all circuits carrying over 5 Amperes, and we recommend a value of 5 amperes for the secondary, and will calibrate the instrument for the value of the primary so that the instrument will be direct reading.

### Model 151

Diameter of case.....9.506 inch
Depth of case.....3.150 inch
Length of scale arc.....6.500 inch

Voltmeters

| Range | List Price |
|---|---|
| 75 Volts | $18 50 |
| 125 Volts | 18 50 |
| 150 Volts | 18 75 |
| 300 Volts | 22 50 |
| 500 Volts | 26 50 |
| 600 Volts | 27 50 |
| 750 Volts | 30 60 |

Ammeters

| Range | List Price |
|---|---|
| 1 Ampere | $17 75 |
| 2 Amperes | 17 50 |
| 3 Amperes | 17 00 |
| 5 Amperes | 17 00 |
| 10 Amperes | 17 00 |
| 15 Amperes | 17 00 |
| 25 Amperes | 17 00 |
| 50 Amperes | 17 50 |
| 75 Amperes | 17 50 |
| 100 Amperes | 17 50 |
| 150 Amperes | 18 00 |
| 200 Amperes | 18 50 |
| 250 Amperes | 18 75 |
| 300 Amperes | 19 00 |
| 400 Amperes | 19 50 |
| 500 Amperes | 20 00 |

### Model 156

Diameter of case.....7.25 inch
Depth of case.....3.15 inch
Length of scale arc.....5.25 inch

Voltmeters

| Range | List Price |
|---|---|
| 75 Volts | $14 50 |
| 125 Volts | 14 50 |
| 150 Volts | 14 75 |
| 300 Volts | 18 50 |
| 500 Volts | 19 50 |
| 600 Volts | 21 00 |
| 750 Volts | 23 50 |

Ammeters

| Range | List Price |
|---|---|
| 1 Ampere | $14 00 |
| 2 Amperes | 13 75 |
| 3 Amperes | 13 50 |
| 5 Amperes | 13 50 |
| 10 Amperes | 13 50 |
| 15 Amperes | 13 50 |
| 25 Amperes | 13 50 |
| 50 Amperes | 13 75 |
| 75 Amperes | 13 75 |
| 100 Amperes | 13 75 |
| 150 Amperes | 14 25 |
| 200 Amperes | 14 75 |
| 250 Amperes | 15 00 |
| 300 Amperes | 15 50 |
| 400 Amperes | 16 50 |
| 500 Amperes | 17 50 |

# Weston Instruments

## SWITCH BOARD

### "Eclipse" Direct Current

Model 160

Model 159

"Eclipse" Instruments in the hands of thousands of users under all the widely varying conditions of practical use, very closely approach the Weston permanent magnet switch board instruments, but of course, as they have evenly divided scales. The scale divisions are, however, excellent for soft iron instruments. They necessarily take more power to operate them than do the Weston permanent magnet instruments but they nevertheless take very little power.

In sensitiveness, or power to promptly respond to minute changes in potential difference, or to minute changes in current strength, they also closely approach the Weston permanent magnet instruments.

They are absolutely dead beat.

They have no discernible working error inasmuch as they indicate precisely the same whether left in circuit for a few seconds or permanently. Their chamber error also is practically nil, as they indicate practically the same at all ordinary temperatures of the room or atmosphere in which they are used. More remarkable still, for soft iron type of instruments they have practically no "magnetic lag" or "hysteresis error," at the normal working voltage point of the different ranges, and relatively to all preceding forms, very little lag error at any point of the scale.

**Model 160**

| | |
|---|---|
| Diameter of case | 9.56 inch |
| Depth of case | 3.15 inch |
| Length of scale arc | 8.50 inch |

Voltmeters with a range above 300 Volts are provided with external resistances

**Voltmeters**

| Range | List Price |
|---|---|
| 75 Volts | $16 00 |
| 125 Volts | 16 00 |
| 150 Volts | 16 00 |
| 300 Volts | 18 00 |
| 500 Volts. | 20 50 |
| 600 Volts. | 21 50 |
| 750 Volts | 22 50 |

**Ammeters**

| Range | List Price |
|---|---|
| 1 Ampere | $15 50 |
| 2 Amperes | 15 50 |
| 3 Amperes | 15 25 |
| 5 Amperes | 15 00 |
| 10 Amperes | 15 00 |
| 15 Amperes | 15 00 |
| 25 Amperes | 15 00 |
| 50 Amperes | 16 00 |
| 75 Amperes | 16 00 |
| 100 Amperes | 16 50 |
| 150 Amperes | 16 50 |
| 200 Amperes | 17 00 |
| 250 Amperes | 17 50 |
| 300 Amperes | 18 00 |
| 400 Amperes | 18 50 |
| 500 Amperes | 19 50 |

**Model 159**

| | |
|---|---|
| Diameter of case | 7.25 inch |
| Depth of case | 3.15 inch |
| Length of scale arc | 5 25 inch |

Voltmeters with a range above 150 Volts are provided with external resistances

**Voltmeters**

| Range | List Price |
|---|---|
| 75 Volts | $12 00 |
| 125 Volts | 12 00 |
| 150 Volts | 12 00 |
| 300 Volts | 14 50 |
| 500 Volts | 16 00 |
| 600 Volts | 17 00 |
| 750 Volts | 18 00 |

**Ammeters**

| Range | List Price |
|---|---|
| 1 Ampere | $12 00 |
| 2 Amperes | 12 00 |
| 3 Amperes | 11 75 |
| 5 Amperes | 11 50 |
| 10 Amperes | 11 50 |
| 15 Amperes | 11 50 |
| 25 Amperes | 11 50 |
| 50 Amperes | 12 50 |
| 75 Amperes | 12 50 |
| 100 Amperes | 13 00 |
| 150 Amperes | 13 00 |
| 200 Amperes | 13 50 |
| 250 Amperes | 14 00 |
| 300 Amperes | 14 50 |
| 400 Amperes | 15 00 |
| 500 Amperes | 16 00 |

# Dimmers

## C. & H. "SIMPLICITY" THEATRE DIMMERS

**Single Plate—For Theatres, Lodge Rooms, Clubs, Halls, Residences, Etc.**

Type No. 3

For Mounting Flat Against the Wall or Switchboard

### TYPE No. 3

#### 2-Wire for 110 Volt Circuit

| List No. | Number 110 V. Lights | Maximum Amperes | | Size Plates Inches | List Price |
|---|---|---|---|---|---|
| | | First Step | Last Step | | |
| 24110 | 4 | 2. | .5 | 9 | $9 50 |
| 24111 | 6 | 3. | .75 | 9 | 9 50 |
| 24112 | 10 | 5 | 1.25 | 9 | 9 50 |
| 24113 | 12 | 6. | 1 5 | 9 | 9 50 |
| 24114 | 15 | 7.5 | 1.88 | 12 | 13 50 |
| 24115 | 20 | 10. | 2.5 | 12 | 13 50 |
| 24116 | 25 | 12.5 | 3.12 | 12 | 13 50 |
| 24117 | 30 | 15. | 3.75 | 16 | 19 00 |
| 24118 | 40 | 20. | 5. | 16 | 19 00 |
| 24119 | 50 | 25. | 6.25 | 16 | 19 00 |

#### 2-Wire for 220 Volt Circuit

| List No. | Number 110 V. Lights | Maximum Amperes | | Size Plates Inches | List Price |
|---|---|---|---|---|---|
| | | First Step | Last Step | | |
| 24210 | 4 | 1. | .25 | 12 | $13 50 |
| 24211 | 6 | 1 5 | 37 | 12 | 13 50 |
| 24212 | 10 | 2 5 | 62 | 12 | 13 50 |
| 24213 | 12 | 3 | 75 | 12 | 13 50 |
| 24214 | 15 | 3 75 | 93 | 12 | 13 50 |
| 24215 | 20 | 5. | 1.25 | 12 | 13 50 |
| 24216 | 25 | 6.25 | 1.56 | 12 | 13 50 |
| 24217 | 30 | 7 5 | 1 87 | 16 | 19 00 |
| 24218 | 40 | 10. | 2 5 | 16 | 19 00 |
| 24219 | 50 | 12.5 | 3.12 | 16 | 19 00 |

Type No. 4

For Mounting at Right Angles to Wall or Switchboard

### TYPE No. 4

#### 2-Wire for 110 Volt Circuit

| List No. | Number 110 V. Lights | Maximum Amperes | | Size Plates Inches | List Price |
|---|---|---|---|---|---|
| | | First Step | Last Step | | |
| 25110 | 4 | 2. | .5 | 9 | $11 75 |
| 25111 | 6 | 3. | .75 | 9 | 11 75 |
| 25112 | 10 | 5. | 1 25 | 9 | 11 75 |
| 25113 | 12 | 6. | 1 50 | 9 | 11 75 |
| 25114 | 15 | 7.5 | 1.88 | 12 | 15 75 |
| 25115 | 20 | 10. | 2 5 | 12 | 15 75 |
| 25116 | 25 | 12.5 | 3 12 | 12 | 15 75 |
| 25117 | 30 | 15. | 3.75 | 16 | 21 25 |
| 25118 | 40 | 20. | 5. | 16 | 21 25 |
| 25119 | 50 | 25 | 6 25 | 16 | 21 25 |

#### 2-Wire for 220 Volt Circuit

| List No. | Number 110 V. Lights | Maximum Amperes | | Size Plates Inches | List Price |
|---|---|---|---|---|---|
| | | First Step | Last Step | | |
| 25210 | 4 | 1 | 25 | 12 | $15 75 |
| 25211 | 6 | 1.5 | .37 | 12 | 15 75 |
| 25212 | 10 | 2 5 | .62 | 12 | 15 75 |
| 25213 | 12 | 3 | .75 | 12 | 15 75 |
| 25214 | 15 | 3.75 | .93 | 12 | 15 75 |
| 25215 | 20 | 5. | 1.25 | 12 | 15 75 |
| 25216 | 25 | 6 25 | 1 56 | 12 | 15 75 |
| 25217 | 30 | 7 5 | 1 87 | 16 | 21 25 |
| 25218 | 40 | 10. | 2 5 | 16 | 21 25 |
| 25219 | 50 | 12 5 | 3 12 | 16 | 21 25 |

Not carried in stock—Shipped from factory Prices on application, F O B. factory

# Wright & Ditson Base Ball Goods

## CATCHERS MITTS

CP, CM, C2 and CMB

CD

C1

C35

C3 and C37

| No. | | Per Doz. |
|---|---|---|
| **CP** | —Major league mitts, French calfskin, molded center with deep pocket, stuff at end of fingers | $90 00 |
| **CM** | —Special French calfskin, specially tanned to break in easy, deep pocket, ends stuffed, rawhide lacing, patent laced thumb | 84.00 |
| **CMB** | —As CM, only made of black calfskin | 84.00 |
| **CD** | —Selected tan calfskin, hollow palm style, hand shaped padding, with special reinforcement to keep the shape | 72.00 |
| **C1** | —Oil tan calfskin, waxed linen stitching, highest grade sheep padding, college model | 60 00 |
| **C2** | —Drab horsehide palm and fingers, green back, well padded | 48.00 |
| **C3** | —Drab horsehide palm and fingers, brown back, professional model | 36.00 |
| **C35** | —Yellow horsehide palm and fingers, chrome tan back, patent laced thumb, extra deep pocket, strap and buckle wrist | 24 00 |
| **C37** | —Black cowhide palm and fingers, oak tan back | 24.00 |

C36

C4

C40

C50, C55

C6

| | | |
|---|---|---|
| **C36** | —Drab horsehide front, chrome tan back and inner fingers, laced edges, special trimming | 18 00 |
| **C4** | —Black leather face and finger, brown back, laced edge, patent laced thumb, extra deep pocket, strap and buckle at wrist. | 12 00 |
| **C40** | —Full sized mitt, fine brown tan leather throughout, carefully padded, with deep pocket, laced edge | 12.00 |

## BOYS CATCHERS MITTS

| No. | | Per Doz. |
|---|---|---|
| **C50** | —Brown tan leather, buckle back and patent laced thumb, deep pocket | 6 00 |
| **C55** | —Laced mitt, black tan front and fingers, green back, buckled wrist | 6.00 |
| **C6** | —Palm and fingers brown tan leather, brown back, laced at thumb and wrist | 3.00 |

No. 10

## PROTECTORS

| No. | | Each |
|---|---|---|
| **310** | —Major league, full size, made of highest grade pure rubber, covered with strong fabric | $10 00 |
| **10** | —League, rubber inflated | 7 50 |
| **11** | —Same as No. 10, only a lighter material | 5 00 |
| **2** | —Youth, well made and good size | 3 00 |
| **C** | —Inter-scholastic, full size | 3 50 |
| **3** | —Boys, brown canvas and heavy padded | 1 00 |
| **7** | **Umpires**—Large size, best quality | 10 00 |

No. 10, Leather

# Wright & Ditson Base Ball Goods

## BASEMAN'S MITTS

| No. | | Per Doz. |
|---|---|---|
| B10 | Major league mitt, Morrill design, large russet calfskin, deep pocket, felt padding, strap and buckle at wrist | $48.00 |
| B1B | —As B10, only made of fine black leather | 48.00 |
| B6 | Professional model, russet tan calfskin, deep pocket, felt padding, strap and buckle at wrist | 42.00 |
| B5 | —Best soft black pliable calfskin | 36.00 |
| B7 | —Horsehide, same pattern as B10, very pliable | 30.00 |
| B2 | Drab horsehide front and back, same pattern as B10 | 24.00 |
| BC | —Same as B1B, but of lighter leather | 15.00 |
| BGB | —Oak tan leather, patent laced thumb and deep pocket, full lined | 18.00 |
| B4 | —Brown tan leather, patent laced thumb and deep pocket, full lined | 12.00 |

## FIELDERS GLOVE MITTS

| No. | | Per Doz. |
|---|---|---|
| M5 | —Major league mitt, selected drab horsehide, welted seams, patent laced back and thumb | $36.00 |
| M4 | —Soft flexible horsehide, same pattern as M5 | 30.00 |
| M3 | —Soft flexible black horsehide, full leather lining | 24.00 |
| M2 | Brown tan, full leather lining, extra padding, welted seams, patent laced back and thumb | 18.00 |
| M1 | —Brown Yucatan front, with leather lined palm, welted seams | 12.00 |

## FIELDERS GLOVES

| No. | | FOP and FN | Per Doz. |
|---|---|---|---|
| FAB | —Genuine Alaskan mukskin, special large professional pattern, long little finger style, best quality soft oak tan lining and a patent pocket, full leather lining | | $42.00 |
| FPL | Pliable drab horsehide, large professional model, full leather lined | | 42.00 |
| FPB | Soft black horsehide, special professional model, large little finger | | 36.00 |
| FOP | —Soft drab horsehide, large little finger, full leather lining, padding carefully arranged around edges to form pocket, no padding in center, for fast fielding | | 36.00 |
| FY | —Black horsehide, full leather lined, very soft and pliable | | 30.00 |
| FN | —Drab leather, full leather lined, deep pocket, designed after FOP model | | 30.00 |

# Wright & Ditson Base Ball Goods

## FIELDERS GLOVES

FS and FW

FC and FX

FZ and FD

F3 and FT

FK and F4

F7 and F6

| No. | | Per Doz |
|---|---|---|
| FS | Strong black calfskin full leather lining, padding arranged heavy around edges to form pocket | $24 00 |
| FW | —Drab leather, full leather lining, padding arranged heavy around edges to form pocket | 24 00 |
| FC | —Green horsehide, full leather lining, especially adapted for hard use | 18 00 |
| FX | —Special black tan leather, full leather lining, big model with large little finger | 18 00 |
| FZ | —Best oak tan leather, full leather lining, big model with large little finger | 18 00 |
| FD | —Choice pearl tan leather, plain palm style, felt lining and welted seams | 12 00 |
| F3 | —Black Napa tan leather, plain palm style, with wide fingers | 12 00 |
| FT | —Selected brown tan leather, plain palm style, leather lined with white welted seams | 12 00 |
| FK | —Black tan leather, small palm style, straight thumb, button back, felt lining, welted seams | 6 00 |
| F4 | —Brown tan leather, small palm style, straight thumb, pocket, felt lining, welted seams | 6 00 |
| F7 | —Black tan leather, boys' sizes, felt lining, good pocket | 3 00 |
| F6 | —Brown tan leather, boys' sizes, felt lining, good pocket | 3 00 |

## BALLS

| No. | | Per Doz |
|---|---|---|
| ML | —Major league, guaranteed regulation size and weight, pure rubber center | $15 00 |
| A | —League ball, wool yarn, rubber center, warranted for one game | 12 00 |
| AB | —Boys' league, similar to A, but designed for boys | 12 00 |
| B | —Expert, regulation weight and size | 6 00 |
| BJR | —Junior professional, same as professional or a smaller size | 6 00 |
| C | —Practice, regulation weight and size | 3 00 |
| CJR | —Junior league, horsehide cover, regulation size | 3 00 |
| D | —Champion, nearly regulation size | 1 20 |
| DJR | —Boys flyer, same size as junior league | 1 20 |
| E | —Star, good material | 60 |
| F | —King, good material | 40 |

## BASES

| No. | | Per Set |
|---|---|---|
| 10 | —Extra quality canvas and quilted | $6 00 |
| 11 | —Heavy canvas, not quilted | 5 00 |
| 12 | —Canvas, ordinary quality | 3 50 |
| 13 | —Bases not stuffed | 2 00 |

All bases complete with anchor plates and lugs. These bases are

## UMPIRE INDICATORS

| No. | | |
|---|---|---|
| 10 | —Umpire indicators | $ 50 |
| 11 | —Scoring tablet | 25 |

# Wright & Ditson Base Ball Goods

## BATS

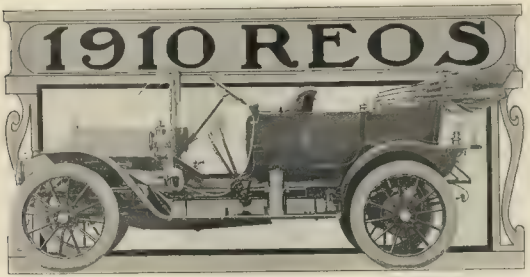
| No. | | Per Doz |
|---|---|---|
| Lajoie | Plain or taped handle, wood thoroughly seasoned, assorted lengths, 32½ to 34 inch | $ 12 00 |
| Tris Speaker | Plain or taped handle, wood thoroughly seasoned, assorted lengths, 32½ to 34 in | 12 00 |
| Little Giant | Bottle neck shape, not too heavy and well balanced, assorted lengths, 29 to 32 in | 12 00 |
| Demon | Tapering model, small at handle tapering to middle, assorted lengths, 32 to 34 inch | 12 00 |
| Walloper | Dark finish, model of weight, assorted lengths, 32 to 36 inch | 12 00 |
| Red Sox | Assorted lengths, 32 to 33 in. | 12 00 |

| | | |
|---|---|---|
| W | Fungo bat, made of soft wood, for knocking fly or ground balls | 1 00 |
| 1 | League model, selected ash, burnt finish | 2 00 |
| 3 | Amateur model, hard ash | 3 00 |
| 5 | Demon Jr., latest model for boys | 1 00 |
| 3B | Boys Jr. League, best ash, ends finished in [illegible] | 2 00 |
| 4 | Youths, selected ash, nicely finished | 1 20 |

## MASKS

| No. | | Each |
|---|---|---|
| ML1 | Major league, annealed steel wire, extra heavy, nickel finish, heavy padding, Lazarus | $ 60 00 |
| M6 | —Professional, heavy steel wire, heavily soldered, removable sun shade. | 48 00 |
| M1 | —Full size, best heavy black wire, well padded | 36 00 |
| M0 | —Extra heavy black annealed wire. | 24 00 |
| 0X | —Heavy wire, black enameled | 18 00 |
| M2 | —Special league, black enameled, extra heavy soft annealed wire, hair padding, covered with leather | 30 00 |
| A | —Amateur, same size and style as league mask, only lighter wire | 12 00 |
| B | —Boys Amateur, same as A, only smaller size | 12 00 |
| C | —Youths, heavy black wire, well padded | 6 00 |
| D | —Light wire, padded, no chin or head rest | 3 00 |
| U | —Umpires mask, with neck and ear protector, all points soldered | 60 00 |

# 1910 REOS



While combining the very best foreign and domestic practice, the new 4-cylinder Reo cars made by the Reo Motor Car Company, of Lansing, Mich., will be strictly American in general design and construction, even going so far as to have the steering wheel on the left-hand side, a practice that is coming into general use. The motor is a 4-cylinder vertical with the cylinders cast in pairs. The bore is 4 inches with a stroke of 4½ inches, while the horse power rating is 30-35. The long stroke is a feature that has been coming to the front for the past year. The car will sell at the popular price of $1250. A detailed description follows:

The cylinders are all made of a special close grained cylinder iron, and are cast in pairs.

The crank case is cast in one piece, giving great rigidity and avoiding all leakage of oil through packed joints of the two-piece type. Connecting rod adjustments can be readily made by simply removing the two hand hole plates on the side of the case. The main crank shaft bearings are adjustable from the outside of the crank case. These features avoid practically any dismantling of the motor in order to adjust the main and connecting rod bearings. The entire operation of adjusting the bearings, it is claimed, does not take over one-half hour.

The crank shaft is of special high-grade manganese steel, having a tensile strength of 110,000 pounds to the square inch. The crank pins are 1½ inches diameter, 2¼ inches long. The three main bearings have a combined length of 10½ inches, with 1½ inch diameter. The crank shaft is offset from the center line of cylinders as is also the cam shaft from the center line of valve plunger guides. This is to avoid excessive piston and cam thrust on cylinders and valve lifter guides.

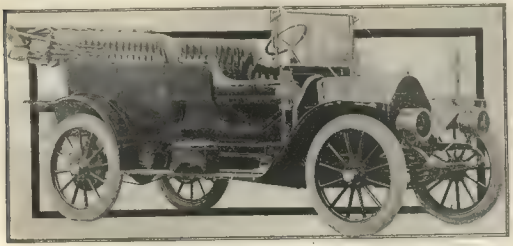


Fig. 1. Reo, Model R. 4-cylinder motor, 4 by 4½ inches. 30-35 H. P. Passenger capacity five. Price $1250. This new popular priced model follows approved touring car practice as applied to four-cylinder machines. It has a wheel base of 108 inches, high road clearance, 34 by 3½ inches Michelin Quick Detachable tires and standard tread.

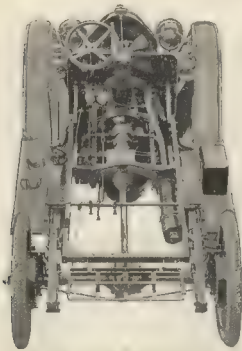


Fig. 3. Partial side view of the new 4-cylinder Reo chassis showing the rear brakes, springs, rear of the dash, control levers and pedals, etc. This car has a special positively released multiple disc clutch and other new features, for which see text.

and engages without chattering or taking hold too severely. It has a positive release due to the fact that the plates are positively dragged apart by the act of opening the clutch, not left to separate by the uncertain action of numerous small springs. Special attention has been paid to securing very large surfaces of contact between the edges of the discs, thus eliminating the rapid wear of the plates and the rattling due to looseness.

The clutch connection to the transmission is through a double universal joint of very liberal proportions, completely encased and packed in grease. This joint is of the full universal type, not the ordinary squared shaft with loose fitting sleeve and consequent back lash.

### THE CHANGE GEARS

The transmission is of the selective type, three speeds forward and one reverse. Gears are hardened and ground after hardening. The teeth are six pitch, with seven-eighths face. The shafts are also all hardened and ground. The sliding gears are carried on a hardened steel shaft having four integral feather keys. The transmission case is a single casting with removable bearings and a large detachable cover. Ball bearings are used throughout, with the exception of the reverse pinion and pocket gear, which are of hardened steel on bronze bushings.

Attention has been given to securing a quiet running, easily operated and oil-tight transmission. All shifting rods and connections are enclosed, doing away with leaky stuffing boxes and outside connections.

### REAR AXLE

The rear axle is of the semi-floating type, shaft driven. The gears are of high grade material, hardened and ground after hardening. The teeth are five pitch. The standard gear ratio is 3½ to 1, 16 and 56 teeth. The gears are mounted on adjustable ball bearings. The outer ends of the axles are on bearings of the roller type, running in hard steel sleeves inserted in the axle tubing. The compensating gear is of the bevel pinion type, all gears and their shafts being hardened.

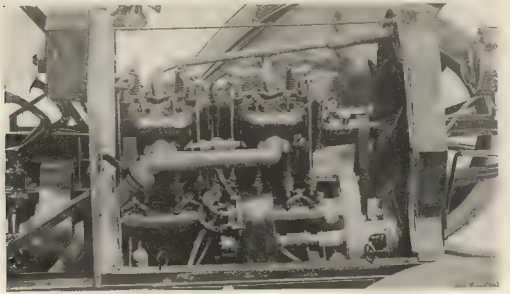


Fig. 4. Exhaust side of the new 4-cylinder Reo engine showing the high tension magneto. Note the light weight bracket which stiffens the dash. Fan is flat belt driven from the crank shaft. Bore is 4 inch and the stroke 4½ inch. All cam shaft gears are spiral cut. Cylinders are cast in pairs and fitted with overhead valves. H. P. rating 30 35.

The driving gears are easily adjusted to their proper position by simply removing the cover to the rear axle housing, and unlocking the adjusting rings. The torsion tube bearings are adjusted entirely from the outside.

The universal joint between the transmission and driving shaft is enclosed in a spherical steel casing forming the upper end of the torsion tube. The spherical portion of this casing is enclosed in a split bronze ring, sliding in a pressed steel casing bolted to the transmission case. This secures a universal connection between the transmission and torsion tube. The universal joint is at all times packed in lubricant fed to it from the transmission case.

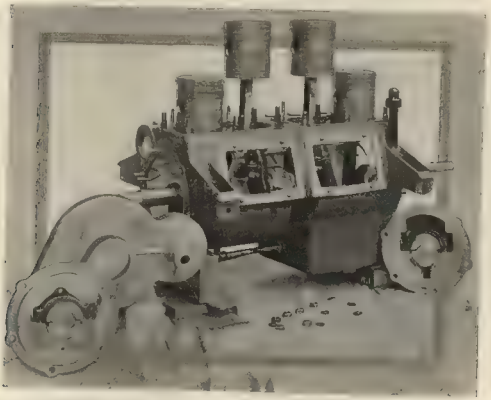


Fig. 5. View of the one piece cast crank case with integral arms and oil reservoir at the base. It also shows the pistons fitted with three rings at the top and provided with oil grooves at the bottom. Attention is called to the large handholes which give access to the crank shaft and connecting rod bearings.

THE TORSION TUBE AND BRAKES.

The torsion arm is a steel tube concentric with and enclosing the driving shaft which is 2½ per cent. nickel steel, hardened and properly heat treated. This shaft runs on adjustable ball bearings.

There are two sets of brakes, external and internal, operating on drums 14 in. diameter, secured to the rear wheels. The driving shaft, axles, torsion tube and all gears are entirely free from any strain due to the application of the brakes.

FRONT AXLE AND STEERING LINKS.

Front axle is an I section one piece drop forging of high grade manganese steel carefully heat treated. The spring seats are forged integral.

The steering spindles are set to make the car self-steering, or so it will keep straight ahead. All steering connections are especially large. The bearings are all bronze bushings, fitted with hard pins. Grease cups are supplied at every wearing point. The axle is designed to protect the steering rods and arms. All steering connections are carried above the axle.

FRAME.

The frame is of pressed steel, hot riveted, carefully braced and has a drop subframe for supporting the motor and transmission, and is "sprung" over the rear axle in order to allow large spring clearance, at the same time allowing the car to carry low.

Between the sub-frame and side members the frame is filled with sheet steel dust plates. A single piece pressed steel under hood is fastened to the sub-frame by eight locking nuts. The sub-frame is carried at a slight angle to the main frame to allow of placing the motor and transmission so as to secure a straight line drive.

The wheel base is 108 inches and the center of the front axle is on a line with the front of the radiator. The rear end of the frame has about eight inches overhang from the rear axle. The motor, trans-

The cam shaft is of large diameter, running in three bronze bearings, and is easily removed. The cam gears are all spiral cut, giving freedom from noise. These gears run in a bath of oil constantly maintained by the motor lubricating system.

The valve lifters are all adjustable, and have hard fibre inserts to deaden the noise. Valves are of large diameter, bevel seated, 35-inch nickel steel heads, electrically welded to cold rolled round steel stems.

Fly wheel is of ample diameter to secure steady running. It has formed within it fan blades to assist in keeping the motor cooled and removing the dead gases from under the hood.

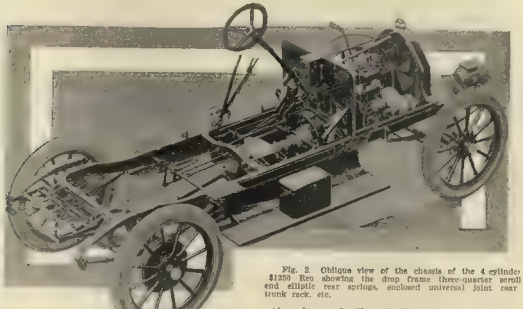


Fig. 2. Oblique view of the chassis of the 4-cylinder $1250 Reo showing the drop frame three-quarter scroll end elliptic rear springs, enclosed universal joint rear trunk rack, etc.

OILING SYSTEM.

The oiling system is of the pump circulative splash type. A single large plunger pump is driven from the cam shaft through an eccentric. It delivers oil from the oil reservoir to the three main bearings of the motor, also to the face of the cam gears. This oil then collects in partition reservoirs in the bottom of the crank case, and is maintained at a constant level. The connecting rods dipping into this oil cause a fine spray which lubricates the cylinders and piston, the amount reaching the cylinders being governed by splash plates. There are in this oiling system no outside pipes or connections to get loose or leak; no stuffing boxes on the pump to require attention; no additional driving gears to operate the pump; no adjustments except those made at the factory when the motor is assembled. The pump is self-cleaning, which instead of drawing all the particles of lint and dirt into the protecting screen by steady suction—as in a gear pump—keeps the screen clean by discharging at least one-half of its capacity against the screen at each stroke. Instead of a large oil reservoir holding two or three gallons, an oil reservoir holding three quarts. This is advisable, since it eliminates the trouble arising from so large a quantity of lubricating oil becoming very dirty and full of carbon deposits. The addition of fresh oil every 250 to 300 miles, the makers claim is far preferable to a larger quantity at longer intervals. Particular attention is paid to making the motor oil-tight, eliminating loss of oil and the attendant filthiness of the motor. The outside main bearings have returned oil leads, as have also the magneto and pump shaft. The valve plunger guides have recesses at the top for collecting oil and returning it to the crank case, and also have protecting caps carefully fitted to keep the dirt out and the oil in. The motor has only a single grease cup—located on the fan.

The water pump is of the centrifugal type, and is driven from the magneto shaft.

The fan is mounted on ball bearings, and is driven by a ⅞-inch flat endless belt. The belt adjustment is very convenient and positive.

CLUTCH.

The clutch is of the multiple disc type. The discs are hardened steel and phosphor bronze, the steel discs being carefully ground after hardening. The clutch is provided with a large ball thrust bearing, to take the thrust when clutch is out. A single spring, easily adjusted, provides the necessary closing pressure on the discs. The whole clutch is so designed that there is no end thrust on the crank shaft when in or out. Special attention has been paid to securing a clutch that releases instantly

mission and body weight are carried well back, adding to the easy riding qualities.

ROAD CLEARANCE.

There is a clearance of twelve inches under the lowest part of the front axle and twelve and a half inches under the fly wheel with the car loaded. The large wheels, which are heavy artillery type, thirty-four inches in diameter, with twelve spokes, give the car an unusually large clearance and standard 56 in. tread. Michelin quick detachable tires 34x3½ in. are used.

The springs are semi elliptic front, three-quarters elliptic rear, all two inches wide.

Fig. 6. View of the rear of the 4-cylinder chassis showing the double set of brakes on the rear wheel, clipped and banded three quarter scroll end springs and the cranked frame side members which give large clearance between the frame and axle, yet with a low body and center of gravity.

Steering gear is of special design, which it is claimed entirely eliminates back lash. A hardened steel bevel pinion and sector of large diameter is used to reduce the motion from the steering wheel. There is but one adjustment.

Steering wheel is sixteen inches diameter, hard rubber rim, mounted on an aluminum spider. The rim has moulded finger grips and will not wear off or get sticky.

Starting crank has four points of engagement on the motor shaft and is locked in a vertical position by a spring check when not in use, doing away with the less convenient leather strap and pocket.

The radiator is of the vertical, flat tube type of very large area, built up in such a manner that it can be easily repaired.

IGNITION

Ignition is by magneto with battery auxiliary to aid in starting, but the car will be equipped with a standard magneto as part of its regular equipment. Provision for attaching a commutator is made. The magneto is attached to its bracket by a single strap, allowing easy removal. The contact points are very accessible and the wiring short and fully protected. A universal joint, packed in grease, is used to connect the magneto to its driving shaft. The magneto drive gear runs in oil inside of the cam gear casing.

Fenders are steel, heavily ribbed and with extension skirts entirely protecting the running boards and motor bonnet. The rear fender is of such shape and size as to entirely protect the top when folded. The fenders are finished in baked black enamel.

The carburetor is of the automatic float type.

The gasoline tank is located under the front seat and is supported by bands passing around it, instead of lugs riveted into its bottom. Its capacity is fifteen gallons.

The muffler is very quiet, and exhausts to the rear. It is equipped with a muffler cut out for high speed driving.

CONTROL.

The controlling levers and the steering wheel are located on the left hand side. The transmission control levers are of the latest swinging selective type, self-locking when in neutral position. The emergency brake lever is located outside of the transmission control lever and operates the internal brakes on the rear wheels. It also holds the clutch out of engagement when these external brakes are locked. There are two foot levers, the right one controlling the outside brakes, on the rear wheels, the left lever controlling the clutch. A smaller foot lever also controls the muffler cut out. These levers are located in a convenient position, and are easily operated. The spark and throttle control is located on the steering post.

BODY.

The body is designed to comfortably carry five passengers. It is of the solid tonneau type, thoroughly upholstered in the best machine buffed leather, and with high grade hair and cushion springs. The tonneau seat is 48 in. wide inside of the upholstering, at the cushion line and the front seat is 40 in. wide inside of the upholstering at the cushion line. The front seat is semi-divided, giving the driver and the front passenger ample elbow room. The body is finished in a permanent blue-black, striped with light blue, and fitted with mahogany trimmings and door panels. Special provision has been made for carrying tire tools, pump and jack, in a very accessible position.

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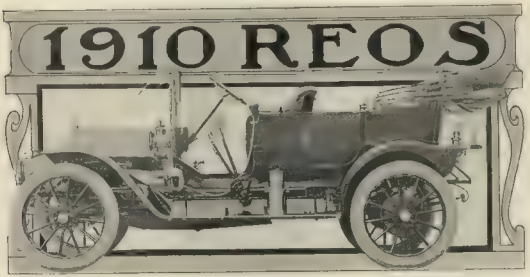
For the first time in eleven years, there will be no motor show in Paris this year, the French manufacturers having by a vote of 79 to 28, decided against holding another show until 1910. This is the result of a disagreement between the Automobile Club of France and the makers.

# 1910 REOS



While combining the very best foreign and domestic practice, the new 4-cylinder Reo cars made by the Reo Motor Car Company, of Lansing, Mich., will be strictly American in general design and construction, even going so far as to have the steering wheel on the left-hand side, a practice that is coming into general use. The motor is a 4-cylinder vertical with the cylinders cast in pairs. The bore is 4 inches with a stroke of 4½ inches, while the horse power rating is 30-35. The long stroke is a feature that has been coming to the front for the past year. The car will sell at the popular price of $1250. A detailed description follows:

The cylinders are all made of a special close grained cylinder iron, and are cast in pairs.

The crank case is cast in one piece, giving great rigidity and avoiding all leakage of oil through packed joints of the two-piece type. Connecting rod adjustments can be readily made by simply removing the two hand hole plates on the side of the case. The main crank shaft bearings are adjustable from the outside of the crank case. These features avoid practically any dismantling of the motor in order to adjust the main and connecting rod bearings. The entire operation of adjusting the bearings, it is claimed, does not take over one-half hour.

The crank shaft is of special high-grade manganese steel, having a tensile strength of 110,000 pounds to the square inch. The crank pins are 1½ inches diameter, 2¼ inches long. The three main bearings have a combined length of 10½ inches, with 1½ inch diameter. The crank shaft is offset from the center line of cylinders as is also the cam shaft from the center line of valve plunger guides. This is to avoid excessive piston and cam thrust on cylinders and valve lifter guides.

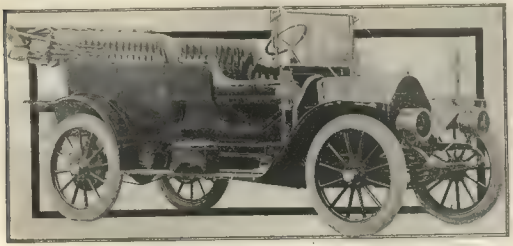


Fig. 1. Reo, Model R. 4-cylinder motor, 4 by 4½ inches. 30-35 H. P. Passenger capacity five. Price $1250. This new popular priced model follows approved touring car practice as applied to four-cylinder machines. It has a wheel base of 108 inches, high road clearance, 34 by 3½ inches Michelin Quick Detachable tires and standard tread.

The cam shaft is of large diameter, running in three bronze bearings, and is easily removed. The cam gears are all spiral cut, giving freedom from noise. These gears run in a bath of oil constantly maintained by the motor lubricating system.

The valve lifters are all adjustable, and have hard fibre inserts to deaden the noise. Valves are of large diameter, bevel seated, 35-inch nickel steel heads, electrically welded to cold rolled round steel stems.

Fly wheel is of ample diameter to secure steady running. It has formed within it fan blades to assist in keeping the motor cooled and removing the dead gases from under the hood.

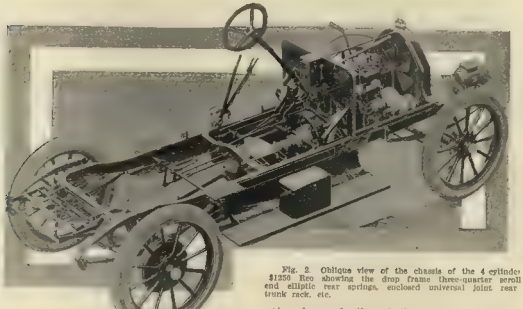


Fig. 2. Oblique view of the chassis of the 4-cylinder $1250 Reo showing the drop frame three-quarter scroll end elliptic rear springs, enclosed universal joint rear trunk rack, etc.

OILING SYSTEM.

The oiling system is of the pump circulative splash type. A single large plunger pump is driven from the cam shaft through an eccentric. It delivers oil from the oil reservoir to the three main bearings of the motor, also to the face of the cam gears. This oil then collects in partition reservoirs in the bottom of the crank case, and is maintained at a constant level. The connecting rods dipping into this oil cause a fine spray which lubricates the cylinders and piston, the amount reaching the cylinders being governed by splash plates. There are in this oiling system no outside pipes or connections to get loose or leak; no stuffing boxes on the pump to require attention; no additional driving gears to operate the pump; no adjustments except those made at the factory when the motor is assembled. The pump is self-cleaning, which instead of drawing all the particles of lint and dirt into the protecting screen by steady suction—as in a gear pump—keeps the screen clean by discharging at least one-half of its capacity against the screen at each stroke. Instead of a large oil reservoir holding two or three gallons, an oil reservoir holding three quarts. This is advisable, since it eliminates the trouble arising from so large a quantity of lubricating oil becoming very dirty and full of carbon deposits. The addition of fresh oil every 250 to 300 miles, the makers claim is far preferable to a larger quantity at longer intervals. Particular attention is paid to making the motor oil-tight, eliminating loss of oil and the attendant filthiness of the motor. The outside main bearings have returned oil leads, as have also the magneto and pump shaft. The valve plunger guides have recesses at the top for collecting oil and returning it to the crank case, and also have protecting caps carefully fitted to keep the dirt out and the oil in. The motor has only a single grease cup—located on the fan.

The water pump is of the centrifugal type, and is driven from the magneto shaft.

The fan is mounted on ball bearings, and is driven by a ⅞-inch flat endless belt. The belt adjustment is very convenient and positive.

CLUTCH.

The clutch is of the multiple disc type. The discs are hardened steel and phosphor bronze, the steel discs being carefully ground after hardening. The clutch is provided with a large ball thrust bearing, to take the thrust when clutch is out. A single spring, easily adjusted, provides the necessary closing pressure on the discs. The whole clutch is so designed that there is no end thrust on the crank shaft when in or out. Special attention has been paid to securing a clutch that releases instantly

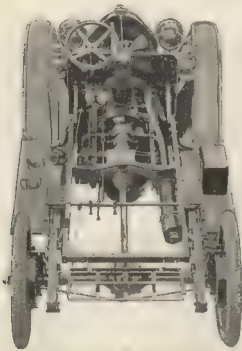


Fig. 3. Partial side view of the new 4-cylinder Reo chassis showing the rear brakes, springs, rear of the dash, control levers and pedals, etc. This car has a special positively released multiple disc clutch and other new features, for which see text.

and engages without chattering or taking hold too severely. It has a positive release due to the fact that the plates are positively dragged apart by the act of opening the clutch, not left to separate by the uncertain action of numerous small springs. Special attention has been paid to securing very large surfaces of contact between the edges of the discs, thus eliminating the rapid wear of the plates and the rattling due to looseness.

The clutch connection to the transmission is through a double universal joint of very liberal proportions, completely encased and packed in grease. This joint is of the full universal type, not the ordinary squared shaft with loose fitting sleeve and consequent back lash.

### THE CHANGE GEARS

The transmission is of the selective type, three speeds forward and one reverse. Gears are hardened and ground after hardening. The teeth are six pitch, with seven-eighths face. The shafts are also all hardened and ground. The sliding gears are carried on a hardened steel shaft having four integral feather keys. The transmission case is a single casting with removable bearings and a large detachable cover. Ball bearings are used throughout, with the exception of the reverse pinion and pocket gear, which are of hardened steel on bronze bushings.

Attention has been given to securing a quiet running, easily operated and oil-tight transmission. All shifting rods and connections are enclosed, doing away with leaky stuffing boxes and outside connections.

### REAR AXLE

The rear axle is of the semi-floating type, shaft driven. The gears are of high grade material, hardened and ground after hardening. The teeth are five pitch. The standard gear ratio is 3½ to 1, 16 and 56 teeth. The gears are mounted on adjustable ball bearings. The outer ends of the axles are on bearings of the roller type, running in hard steel sleeves inserted in the axle tubing. The compensating gear is of the bevel pinion type, all gears and their shafts being hardened.

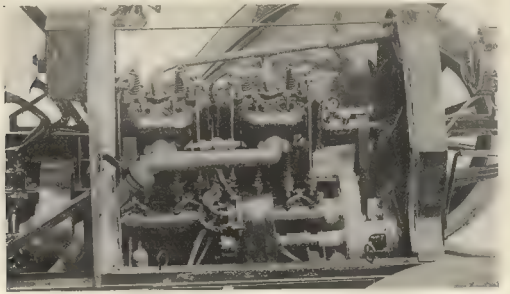


Fig. 4. Exhaust side of the new 4-cylinder Reo engine showing the high tension magneto. Note the light weight bracket which stiffens the dash. Fan is flat belt driven from the crank shaft. Bore is 4 inch and the stroke 4½ inch. All cam shaft gears are spiral cut. Cylinders are cast in pairs and fitted with overhead valves. H. P. rating 30 35.

The driving gears are easily adjusted to their proper position by simply removing the cover to the rear axle housing, and unlocking the adjusting rings. The torsion tube bearings are adjusted entirely from the outside.

The universal joint between the transmission and driving shaft is enclosed in a spherical steel casing forming the upper end of the torsion tube. The spherical portion of this casing is enclosed in a split bronze ring, sliding in a pressed steel casing bolted to the transmission case. This secures a universal connection between the transmission and torsion tube. The universal joint is at all times packed in lubricant fed to it from the transmission case.

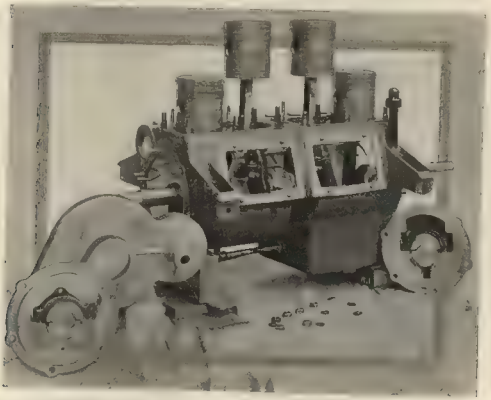


Fig. 5. View of the one piece cast crank case with integral arms and oil reservoir at the base. It also shows the pistons fitted with three rings at the top and provided with oil grooves at the bottom. Attention is called to the large handholes which give access to the crank shaft and connecting rod bearings.

THE TORSION TUBE AND BRAKES.

The torsion arm is a steel tube concentric with and enclosing the driving shaft which is 2½ per cent. nickel steel, hardened and properly heat treated. This shaft runs on adjustable ball bearings.

There are two sets of brakes, external and internal, operating on drums 14 in. diameter, secured to the rear wheels. The driving shaft, axles, torsion tube and all gears are entirely free from any strain due to the application of the brakes.

FRONT AXLE AND STEERING LINKS.

Front axle is an I section one piece drop forging of high grade manganese steel carefully heat treated. The spring seats are forged integral.

The steering spindles are set to make the car self-steering, or so it will keep straight ahead. All steering connections are especially large. The bearings are all bronze bushings, fitted with hard pins. Grease cups are supplied at every wearing point. The axle is designed to protect the steering rods and arms. All steering connections are carried above the axle.

FRAME.

The frame is of pressed steel, hot riveted, carefully braced and has a drop subframe for supporting the motor and transmission, and is "sprung" over the rear axle in order to allow large spring clearance, at the same time allowing the car to carry low.

Between the sub-frame and side members the frame is filled with sheet steel dust plates. A single piece pressed steel under hood is fastened to the sub-frame by eight locking nuts. The sub-frame is carried at a slight angle to the main frame to allow of placing the motor and transmission so as to secure a straight line drive.

The wheel base is 108 inches and the center of the front axle is on a line with the front of the radiator. The rear end of the frame has about eight inches overhang from the rear axle. The motor, trans-

mission and body weight are carried well back, adding to the easy riding qualities.

ROAD CLEARANCE.

There is a clearance of twelve inches under the lowest part of the front axle and twelve and a half inches under the fly wheel with the car loaded. The large wheels, which are heavy artillery type, thirty-four inches in diameter, with twelve spokes, give the car an unusually large clearance and standard 56 in. tread. Michelin quick detachable tires 34x3½ in. are used.

The springs are semi elliptic front, three-quarters elliptic rear, all two inches wide.

Fig. 6. View of the rear of the 4-cylinder chassis showing the double set of brakes on the rear wheel, clipped and banded three quarter scroll end springs and the cranked frame side members which give large clearance between the frame and axle, yet with a low body and center of gravity.

Steering gear is of special design, which it is claimed entirely eliminates back lash. A hardened steel bevel pinion and sector of large diameter is used to reduce the motion from the steering wheel. There is but one adjustment.

Steering wheel is sixteen inches diameter, hard rubber rim, mounted on an aluminum spider. The rim has moulded finger grips and will not wear off or get sticky.

Starting crank has four points of engagement on the motor shaft and is locked in a vertical position by a spring check when not in use, doing away with the less convenient leather strap and pocket.

The radiator is of the vertical, flat tube type of very large area, built up in such a manner that it can be easily repaired.

IGNITION

Ignition is by magneto with battery auxiliary to aid in starting, but the car will be equipped with a standard magneto as part of its regular equipment. Provision for attaching a commutator is made. The magneto is attached to its bracket by a single strap, allowing easy removal. The contact points are very accessible and the wiring short and fully protected. A universal joint, packed in grease, is used to connect the magneto to its driving shaft. The magneto drive gear runs in oil inside of the cam gear casing.

Fenders are steel, heavily ribbed and with extension skirts entirely protecting the running boards and motor bonnet. The rear fender is of such shape and size as to entirely protect the top when folded. The fenders are finished in baked black enamel.

The carburetor is of the automatic float type.

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CONTROL.

The controlling levers and the steering wheel are located on the left hand side. The transmission control levers are of the latest swinging selective type, self-locking when in neutral position. The emergency brake lever is located outside of the transmission control lever and operates the internal brakes on the rear wheels. It also holds the clutch out of engagement when these external brakes are locked. There are two foot levers, the right one controlling the outside brakes, on the rear wheels, the left lever controlling the clutch. A smaller foot lever also controls the muffler cut out. These levers are located in a convenient position, and are easily operated. The spark and throttle control is located on the steering post.

BODY.

The body is designed to comfortably carry five passengers. It is of the solid tonneau type, thoroughly upholstered in the best machine buffed leather, and with high grade hair and cushion springs. The tonneau seat is 48 in. wide inside of the upholstering, at the cushion line and the front seat is 40 in. wide inside of the upholstering at the cushion line. The front seat is semi-divided, giving the driver and the front passenger ample elbow room. The body is finished in a permanent blue-black, striped with light blue, and fitted with mahogany trimmings and door panels. Special provision has been made for carrying tire tools, pump and jack, in a very accessible position.

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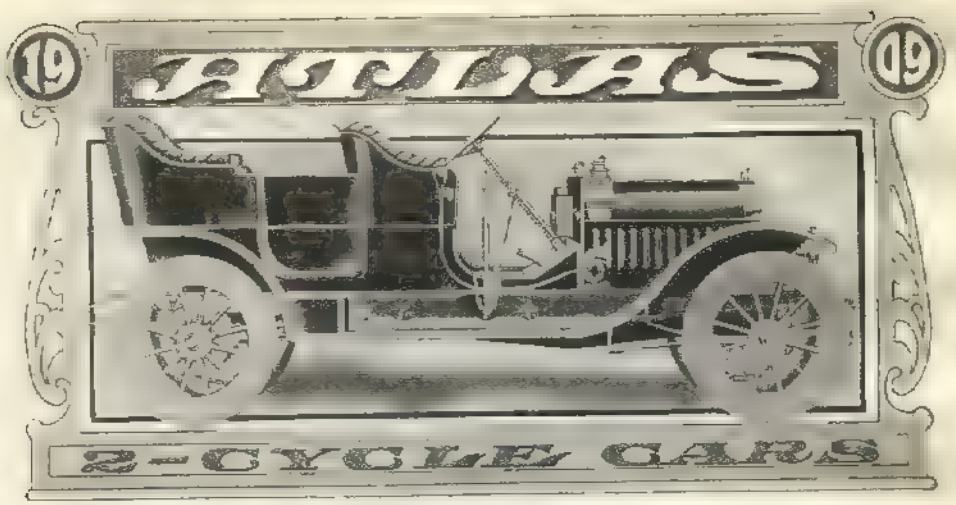



HIGH DOLNAR

The Atlas Motor Car Company, Springfield, Mass., U. S. A., will offer for the season of 1909 two chassis models, one with 3 cylinders and one with 2 cylinders. All of the Atlas motors are 2-cycle and water cooled, with built-up crank shafts, centrifugal water-circulating pump and fan.

The 3-cylinder chassis will be furnished with a 5-passenger touring car body and a folding seat roadster body, for 3 or 4 passengers. The 2-cylinder chassis is made in two lengths of wheel base, the longer being fitted with a taxicab or a town car body, while the shorter 2-cylinder chassis is fitted with either a 2 or 3-passenger runabout body.

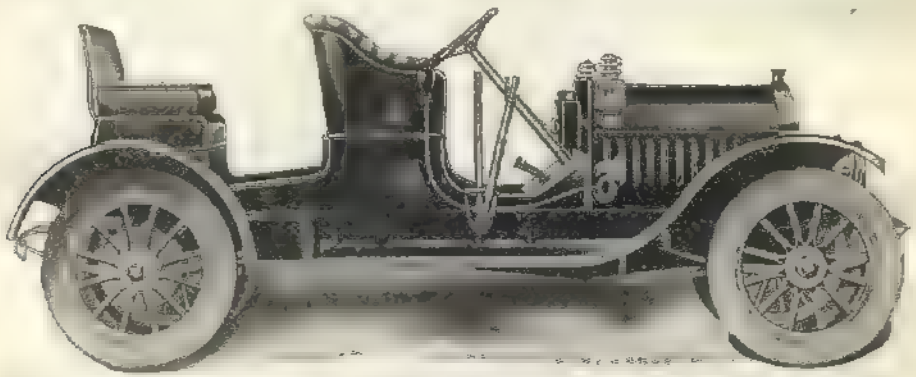


Fig. 1. The Atlas 1909 3-cylinder runabout. Wheel base, 110 inches, gauge, 56 inches. Tires all 34x4 inches. Motor 3 cylinders, 4½x4½ inches, 30 H. P., 2-cycle water cooled, with centrifuga. pump and fan, ignition, jump sparks, dry cells, Atwater-Kent spark generator, Atlas clutch 3 forward speeds and a reverse sliding gear to main gear, balance gear and divided rear axles. Weight, about 2300 lbs. Price, $1900.00, with seats for 4 passengers, folding seats in rear, including 5 lamps, mats, horn and tools. The 5-passenger touring car shown in the head piece sells for $2000.00 with same equipment.

During the season of 1908 the Atlas factory was greatly enlarged, about doubling its capacity. The machine-tool equipment is excellent, and the company expects to turn out in 1909 about 300 3-cylinder cars and about 200 2-cylinder cars, the 2-cylinder models fitted principally with taxicab bodies, the Atlas taxicab being received with much favor because of its sure start, simplicity, substantial construction and fine appearance.

NOTABLE FEATURES

The characteristic feature of the Atlas cars is the 2-cycle motor, 3 cylinders or 2 cylinders, same cylinder unit in all Atlas motors, water cooled with centrifugal water-circulating pump, and fan in front.

This company has given a thorough tryout to 2-cycle motors water cooled by thermal circulation without a fan in front, and is now equipping all its motors with centrifugal water circulating pumps and front fans. These 2-cycle motors are notable for flexibility, giving a strong drive on high gear at as low a rate as 2½ miles per hour.

BUILT UP CRANK SHAFT

The second notable feature of the Atlas motor is the built-up crank shaft, which permits hardening and grinding the crank

per part of CB when they are bolted together, and this annular space, AS, is the charge transfer passage from the crank-box to the cylinder intake ports. The ports are in two planes, the exhaust ports, above the intake ports, opening into the annular exhaust passage, Ex, cored around the cylinder above its flange. The intake ports open into the annular passage, AS, leading from the crank-box up to the intake ports There are four intake ports and four exhaust ports, arrangement, locations and port-dimensions shown in Figs. 7 and 8. The section shows the annular exhaust-port with its side opening into the exhaust branch-pipe. The cylinders are cast with integral water-jackets, W.

down hard on the heads, screws, split-pin retained.

THE CONNECTING RODS.

These are steel drop forgings, 8 ins. center to center; the cylinders are offset ¾ of an in., and the piston stroke is 4½ ins. The rod-bodies are 1¼ ins. wide x ⅛ in thick. The top eyes are 1⅜ dia. outside x 2 ins. long. The bottom eyes are 2⅛ out. dia. x 2 ins. long. The top end rod-bushes phosphor bronze, are 1⅜ out. dia. x 1⅛ inside dia. x 2 ins. long, with a ⅝ wide x ⅞ long square oil opening on top, and a saw-cut whole length, completely separating the bush wall at one side of the square oil-opening. The oil opening on top of the top end of rod is ⅞ long by

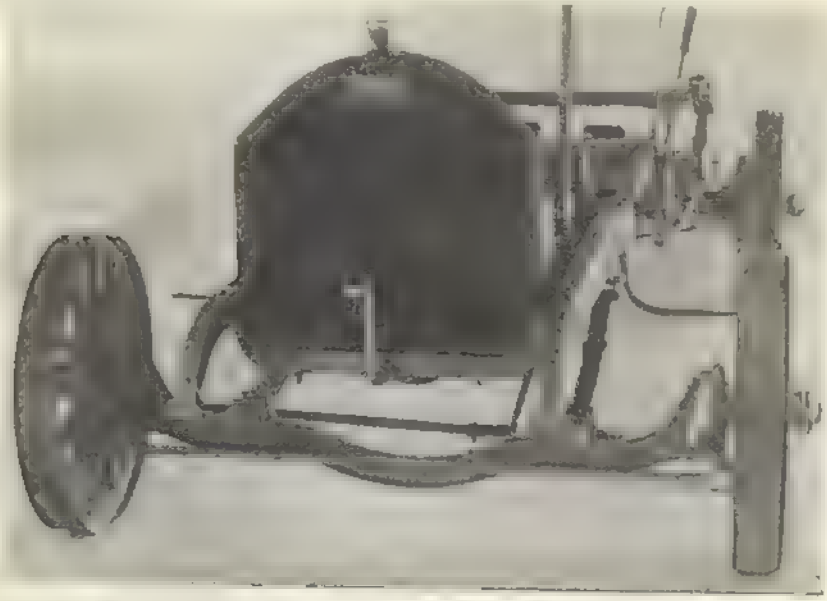


Fig 5 Front of Atlas 8-cylinder chassis, showing front axle construction and radiator placing

THE PISTONS

These are shown in Fig. 9 in section and plan, with dimensions. The piston head top surface is close below the bottom line of the cylinder exhaust-ports when the piston is at low point, as in Fig. 7. Four depressions in the piston head serve to uncover the intake-ports when the piston is in low position, so that the charge, compressed to about 10 lbs. in the crank-box can rush into the cylinder through the four intake ports, 90 deg. apart, in the cylinder, as shown. As the piston and cylinder are proportioned and shaped the piston displacement does not give charge-volume enough to fill the cylinder above the exhaust ports, unless the charge volume is somewhat expanded by heat. The compression is said to be 50 lbs., cylinder full of pure cold air and hand cranked to top of stroke.

The piston pins are hardened and ground steel, 1⅛ dia. with a ⅝ hole clear through, retained by tit screws, turned 1⅜ chord length outside measurements. The rod wrist bush is 1¾ x 2 ins. outside, with 1⅛ in. dia. wrist hole, cut with two shallow lengthwise grooves at the sides, inside, with a connecting middle groove on top, connecting with 3-16. dia. oil holes on top of wrist eye. This wrist-bush, phosphor bronze, is not split lengthwise, and is forced into the rod eye.

The motor is carried on two very substantial angle steel cross girts, 3x2x¼ in. wide member vertical, narrow member at bottom, ends resting on brackets applied to insides of chassis frame sides, and retained with one screw in each of the four motor-cross-girt ends.

RADIATOR SUPPORT

The radiator sits on the front cross-girt of the chassis frame, on two rubber-belting pads, and is retained by two bolts up through the cross-girt top member, threaded into the bronze base of the radiator, as shown in Fig. 5.

ing detrimental wear.

Also, since the wrist can be removed from the crank shaft the connecting rod can have solid eyes, not capped, with single-piece bronze-bushes at both ends, no adjustment. This built-up crank shaft also permits the employment of single-piece bronze sleeves for the crank shaft bearings, with no adjustment of any kind.

Because the 2-cycle motor is at this time of great interest, this motor is here illustrated and described in sufficient detail to fully present the Atlas 2-cycle practice, which includes crank-box cylinder supply by a single diameter piston, a rotary crank-box intake valve, patented, and working cylinder ports in two planes, four ports in each plane.

These cars used wood chassis frames with truss-rods underneath up to the end of 1908, but will use pressed-steel chassis frames exclusively in its 1909 production.

The clutch is an exterior band coacting with the outside surface of a cylindrical clutch-drum, integral with the fly wheel, and carburetor is also an Atlas design and construction. The stand pipe is in the center of the float. Air enters at the top at the left and passes a disc valve, downward. This disc valve is closed by a rocker to obtain a rich charge at starting

THE FRONT AXLE

This is I-section, greatest depth 2½ ins., width 1⅞ ins., ribs and webs 3-16 ins., no weld, front wheels on Timken rollers, adjustable, all usual construction.

THE REAR AXLE

The steel-casting bevel-gear housing, divided in vertical plane only, is rivetted and brazed to the steel tube axle sleeves, as are the spring perches and brake-drum covers, all ordinary construction. The balance-gear-drum journals and the live rear axles are on Hyatt roller bearings, with ball-thrust bearing to take the bevel-gear thrust. The balance gear is spur pinions.

Neither struts nor torsion arm are fitted, their functions being performed by the rear springs. The propeller shaft is solid steel shafting, 1⅜ diameter, with Spicer universal joints on each end, ordinary construction. The pinion shaft is on "New Departure" double ball bearings, ordinary construction.

[illegible]

These are half-elliptics in front and ¾ elliptics in the rear. The front springs are 40 ins. long x 2 ins. wide, 6 leaves, tongued and grooved, jointed to the chassis in front and linked in the rear, perched 18 ins from front eye to middle of front axle. The rear spring lower member is 51 ins. long x 2 ins. wide, 8 leaves, tongued and grooved, perched 28 ins. from front eye to the middle of the rear axle. The rear-spring top-member has a scroll-head, is 2 ins. wide, 8 leaves.

THE CAB CHASSIS FRAME

The frame for the cab is pressed steel 3-16 ins. thickness, flat on top, greatest depth 4½ ins. widths 32 and 29½ ins.,

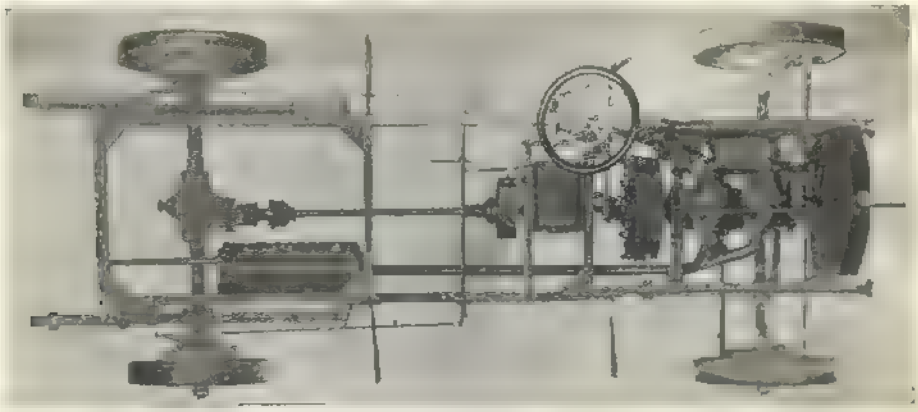


Fig. 4. Atlas 2-cylinder chassis plan. The springs are half-elliptic in front and ¾ elliptic in the rear. The control is on the left side, as is the rule with cabs, and as will probably be the case with all cars finally placing the driver on the side where he can see what he needs to see in passing to the right and making turns to the left where possible, as is the rule

134½ ins. long from front spring eye to rear end. The 3-cylinder chassis frame is also 3-16 thick x 4½ ins. greatest depth, is 141 ins. long from front spring eye to rear end, is flat on top and is all one width, 32 ins. Both the 2-cylinder and the 3-cylinder chassis frames are 1½ ins. wide, giving unusual strength with the 3-16 thickness of metal. The general chassis frame construction is shown in the plan and various illustrations.

THE MOTOR

The cylinders, C, Fig. 7, are flanged close below the exhaust port circle, Ex, and bolted to the top flange of the crank-box, CB. Short sleeves, FS, double flanged, are interposed between the crank-boxes, CB. All flanges are of course finished, all so as to permit the assembling of a motor with any number of cylinders from the units C, CB and FS. The lower end of the cylinder, C, is smaller than the inside diameter of the top, cylindrical, flanged member of CB, and so leaves an annular space between the lower part of C and the up-

the change gear stand still while being shifted.

THE CHANGE GEAR.

The change speed mechanism is of sliding gear type selectively operated 3 forward speeds and a reverse for the 2-

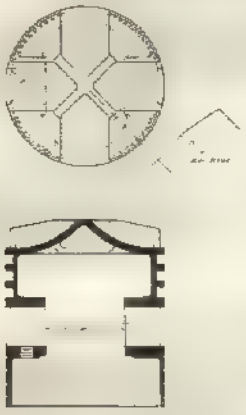


Fig. 9. Atlas 2-cycle motor piston. Four depressions in the piston head serve to uncover the intake ports when the piston is in low position. Charge transferred.

cylinder chassis. The gearing is all nickel steel, all 8, d. p., all ⅞ face, and all the gears are hardened. The line and side shafts are in Timken roller bearings, adjustable. The gear-box and cover are aluminum castings.

THE BRAKES

The rear hub-drums are pressed steel, 14 ins. out. dia., about 13⅝ ins. dia. inside, and have 2 ins. face. The internal expanding brake shoes are Raybestos faced and are toggle-joint expanded. No exterior rear brake-band is fitted.

four working extreme positions and one neutral position. This gear-shift lever is interlocked with the clutch-rocker so that the clutch must be disengaged before a gear-shift can be attempted. The left large pedal is pushed forward to disengage the

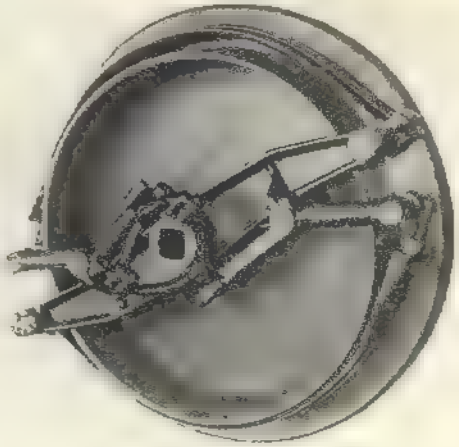


Fig. 11. Atlas clutch. Two contracting half bands of steel Raybestos" faced acting on a 20 in. flanged rearwardly projecting fly wheel flange. For details see text "The Clutch."

clutch. The right large pedal is pushed forward to apply the line shaft brake-band to the line-shaft brake-drum, placed close in the rear of the gear-box.

Neither muffler cut-out pedal nor accelerator pedal are fitted.

The brake-rods to the rear hub brakes are screw-adjusted for length, the brakes being applied directly without eveners from a single rock-shaft.

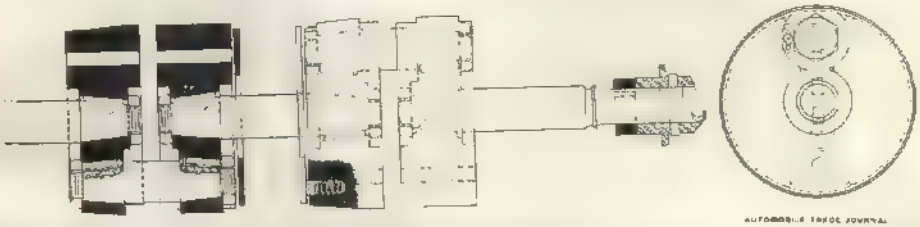


Fig. 10. Atlas motor built-up crank-shaft, showing the general features of the construction. Note the inner spring pressed discs which act as crank case rotary valves as described in the text

The line shaft brake-drum, gray iron, is 10 ins. out. dia. x 3 ins. face, is fitted with an external steel band, one piece, about 1-16 x3 ins., Raybestos faced, bell-crank applied through the right pedal. The line-shaft brake is the ordinary brake. The brakes and clutch are not interlinked.

CONTROL

The steering is a well known form of screw and nut action, right and left external and internal threads. The spark and throttle levers are ratchet retained on top of the hand-wheel and do not move with it. The outside hand-lever, latched, is pulled backward to apply the internal rear brakes. The inside hand-lever is fulcrumed in the slot, is not latched, and has

ON THE ROAD

The writer made something like 250 miles, all told, on various Atlas cars, the last run of 75 miles or so, February 28th, 1909, being the only one made on the regular 3-cylinder, 5-passenger car, motor equipped with a water circulating pump and front fan. Knox made a very determined effort to eliminate the water circulating pump and the front fan and did not finally decide to place the pump and fan until late in 1908, with the result that no 3-cylinder car with pump and fan was available at Springfield during the writer's stay there, so that about 150 miles was made on an Atlas 5-passenger car, 3-cylinders, thermal circulation and no front fan.

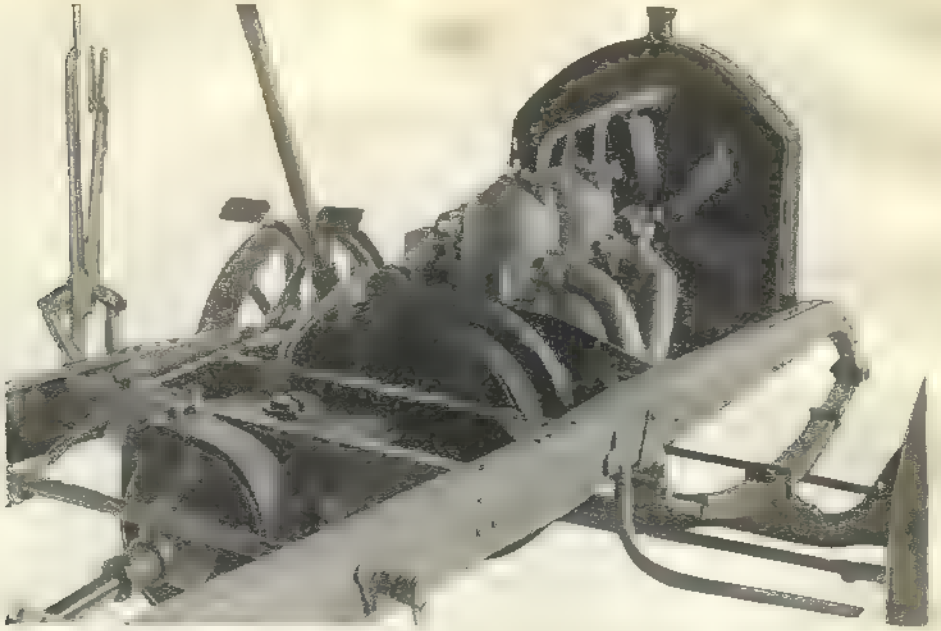


Fig. 6. Atlas 2-cylinder chassis, showing motor support and control construction, clutch and gear box

THE CLUTCH

The fly wheel is 20 ins. dia., and has a 16 in. dia. clutch drum, 3 ins. face, projecting to the rear. This is encircled by two half-bands, Raybestos faced, 2½ ins. wide; one end of each half band is fixed to a bronze arm, double ended, which has a square eye slipped on the squared front end of the line shaft; the other end of each half-band is fixed to the outer end of its respective lever, jointed to the bronze arm, and these free-end band-levers have their inside ends toggle-separated to apply the clutch bands to the fly wheel clutch-drum face by a long pull-out coiled spring which is hooked to the clutch pedal as shown in Fig. 11.

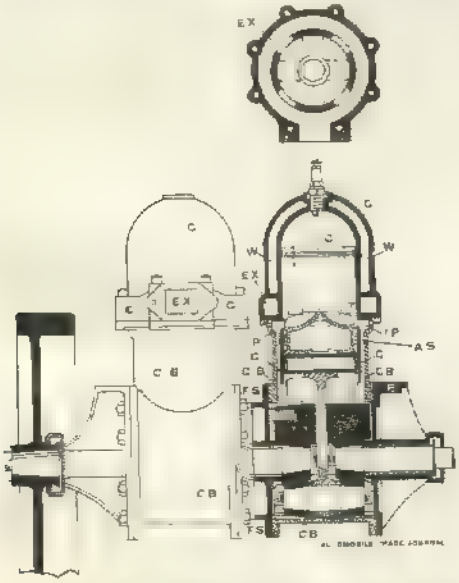
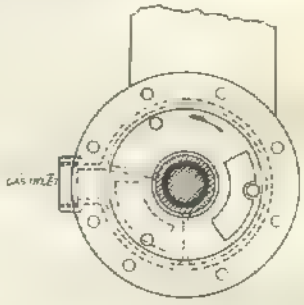



Fig. [illegible] Atlas 2-cylinder motor [illegible] C cylinder [illegible] crank-case [illegible] FS, double flanged sleeve [illegible] P intake port AS, annular [illegible] passage from [illegible] ex to intake ports



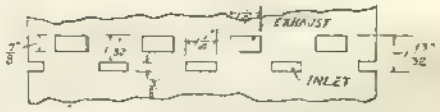




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Fig. 8. Development of port-containing cylinder-surface [illegible] arrangement, forms and dimensions of ports, and [illegible] section midway between adjacent cylinders, showing [illegible] grease [illegible] retaining [illegible] with the crank shaft, length of ports such as to open crank-[illegible] the circumf[illegible] through about 160 degrees of crank [illegible]

This clutch is easily worked and has been in wholly satisfactory use for nearly a year. When the pedal is pushed forward the flanged clutch collar is pulled back to disengage the clutch, forcing the flange against a leather friction so as to stop the line-shaft revolution at once, making

This form of Atlas motor can be driven hard for about 20 miles and then, for some cause or other, it begins miss firing. With the water circulating pump and front fan the Atlas 3-cylinder motor has unlimited range, giving from 2½ miles an hour upward on high gear, starting at the first twitch of the crank and running with no noise at all at any desired speed, thus giving the lie to all the 4-cycle experts who say that the 2-cycle motor lacks "flexibility" in a manner highly satisfactory to the Atlas management and engineering department.

This run was nearly all on good roads, only one short stretch of sand and one wet stretch. The motor performance was perfect and the run was made on 3½ gallons of gasoline, a very low fuel consumption indeed. The three 2-cycle cylinders give the smooth 4-cycle, 6-cylinder torque and the Atlas 5-passenger touring car is roomy and easy riding, giving as agreeable translation as any car within Hugh Dolnar's experience.

The one notable feature in this performance is the motor strength with low throttling. The maximum compression is 50

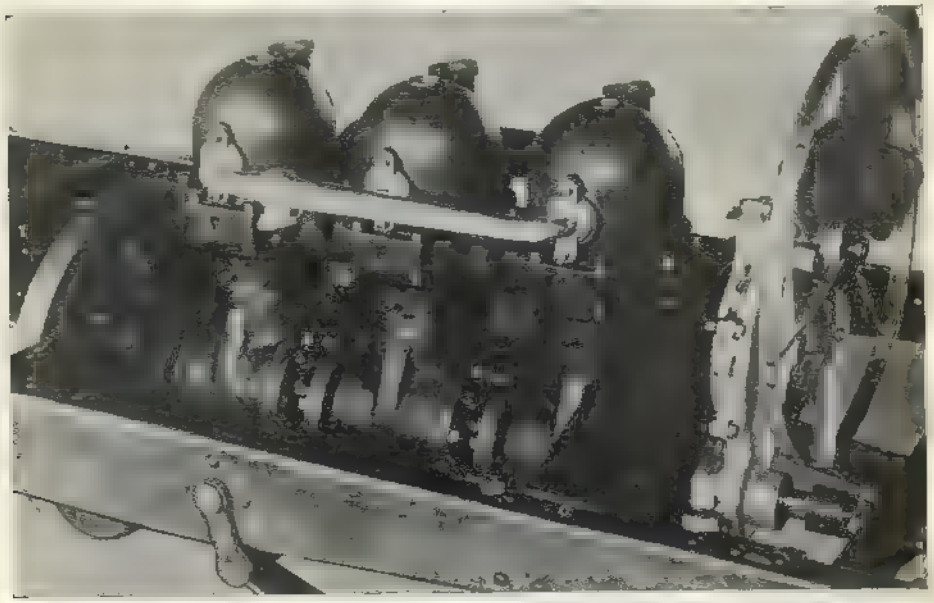

Fig. 12. Atlas 3-cylinder motor in place in chassis, right side. Each cylinder and crank case is a unit, the three being rigidly bolted together. Note the simplicity of the construction and the tapered water pipe

The motor starts promptly, is really silent, and gives the car any pace from 2½ miles per hour to maximum on high gear, is strong at all throttle positions, can climb a reasonably stiff grade at 2½ miles per hour on high gear, and runs right along on pavement with an early spark and small charge, perfectly obedient to the throttle at all speeds.

The February 28th run, Broadway and 66th to 130th and 7th Avenue, 5th Avenue to the new bridge, Bedford Avenue to Prospect Park, the Parkway, and Coney Island, return by Fort Hamilton, Brooklyn Bridge, Broadway, 5th Avenue, Central Park, 130th Street and back to Broadway and 66th Street was made with five passengers, no very light weights, in about 3 hours' running time, about 75 miles, Mr. Johnson, the Atlas New York Sales Manager, driver and the writer as observer.

lbs. The crank box compression is high, as the clearance is small, and the Atlas cylinders are said to show 10 H. P. each at 1800 R. P. M.

The writer would like to see the effect of higher charge compression in this motor. It is not impossible that the 50 lbs. charge compression is a survival of the no-pump no-fan period, and, as the motor now cools well, higher charge compression might show more maximum H. P. and even better flexibility, good as the performance now is.

Taken altogether it is safe to say that the 3-cylinder, 2-cycle motor is in every way fully equal to the 6-cylinder, 4-cycle motor for car-driving, while the 2-cycle has only half the number of cylinders, weighs much less, takes less room and does not cost one-half as much as the 6-cylinder, 4-cycle motor with cylinders, bore and piston stroke the same as the 2-cycle.

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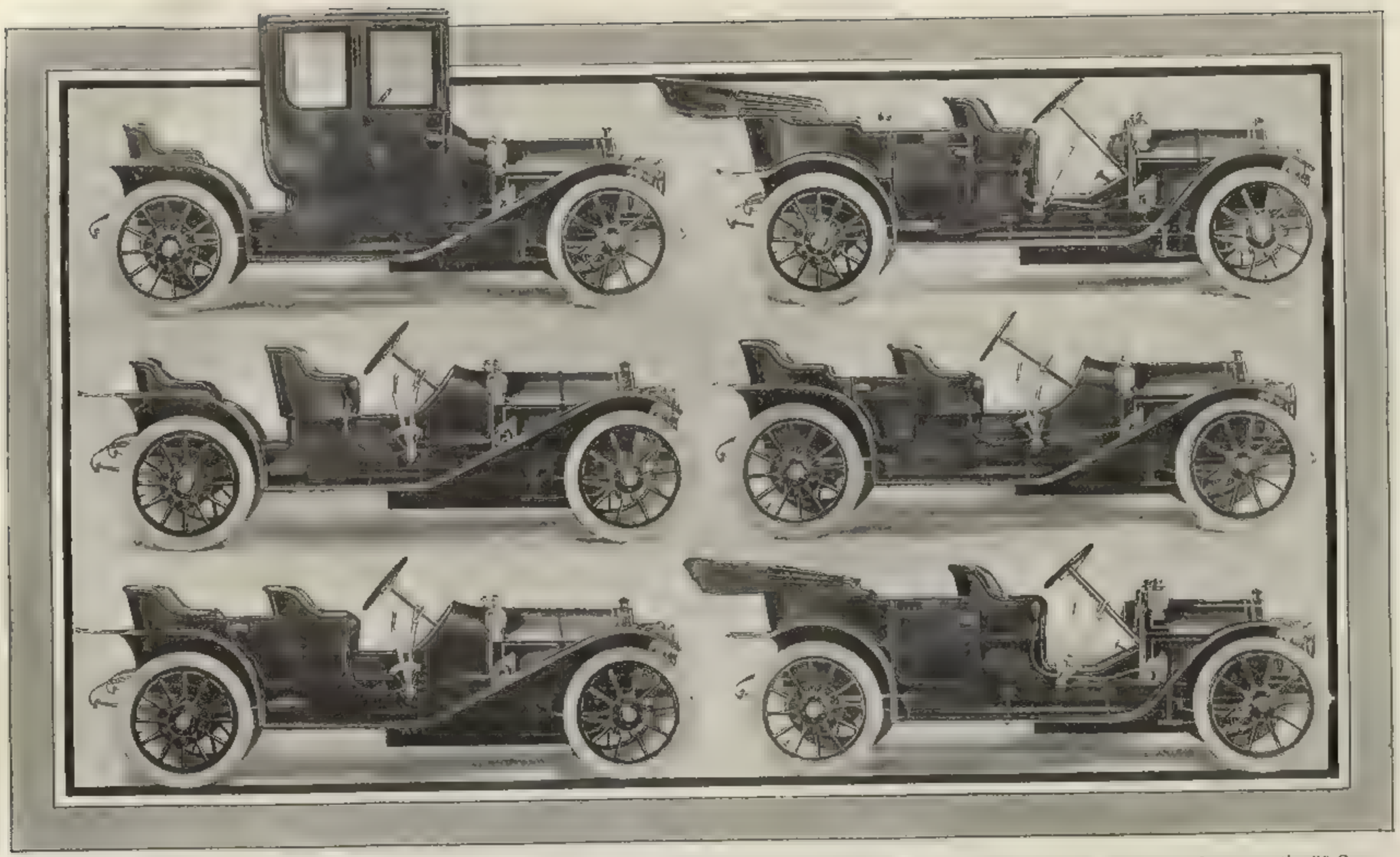
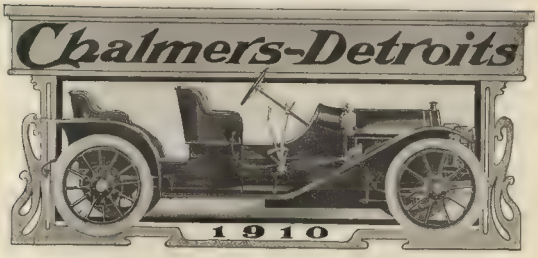
The Lexington Motor Car Co., of Dayton, Ohio, has been incorporated with a capital stock of $50,000.00 and is going into the manufacturing business, expecting to turn out a car that will retail from $2500 to $3000.



Group of 1910 Chalmers-Detroit models, showing the various styles of bodies offered for the coming season. In the left column, beginning at the top, is the 30 Coupe, fitted with rumble seat at the rear. The wheel base has been increased to 115 inches and the hood raised and lengthened. Price, $2100. Below it is the 40 Roadster, motor 5 inches x 4¾ inches, and below it is shown the 40 close coupled car. In the right hand column at the top is the 40 seven passenger touring car. All the 40 models are $2750, but $75 is charged extra for the two extra seats of the touring car. The other two models are the 30 close coupled and the 30 touring car, price $1500




Two chassis models will be manufactured by the Chalmers Detroit Motor Company for 1910. Both models will practically be a continuation of those presented for 1909 with such modifications as a year's experience has shown to be advisable. Various bodies to suit every taste will be furnished to fit the "30" chassis, while the "Forty" chassis will be fitted with touring car, pony tonneau and roadster type bodies.

The "30" chassis will have a motor 4 in. x 4½ in., an increase of ⅛ in. over the bore of the 1909 car. In practically every other respect the motor will be identical with last season's, except that the oil pump has been placed in a more accessible position. The crank shaft is still mounted on two ball bearings as this has proved during the past season to be very satisfactory.

Large inlet valves mounted in the heads of the cylinders, which have been a feature of the Chalmers-Detroit "30" since its inception, are retained for 1910.

The circulating positive feed oiling system is retained in practically its original form. The Chalmers-Detroit construction of inlet manifold castings in one piece with water jacket side plates is a special feature this year as last. Perhaps the most striking feature to the casual observer is the size of the exhaust manifold and piping to muffler, this combined with large exhaust valves being used to eliminate all back pressure and to clear the cylinders promptly of burned gases.

The multiple disc clutch for 1909 has

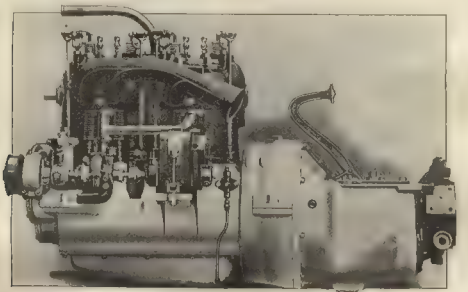


Fig. 1. Exhaust side of the Chalmers-Detroit "30" unit power plant. The exhaust manifold is unusually large being 3¼ inches. Magneto is mounted on an integral bracket of the crank case. A plunger oil pump is operated by an inlet cam of the cam shaft. All parts are completely housed.

been so successful that it has been retained exactly as it was. The transmission is in a unit with the motor and clutch. Three speeds and reverse are provided with a selective arrangement. The bearings throughout are annular ball. The gears are made of chrome vanadium steel, and treated with the greatest care. The teeth are all heavy pitch and the gears arranged in as compact a manner as possible in order to keep the shafts short.

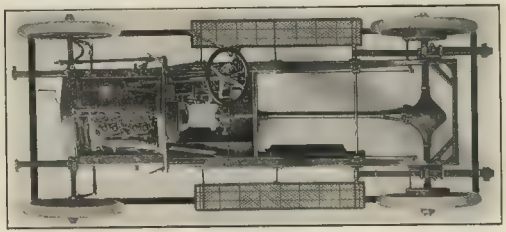


Fig. 2. Chalmers-Detroit 36 chassis, from above Note clean cut appearance, also self contained automatic bonnet locks and webbed or tapered side frame members

The final drive takes place through a single steel bushed metal cased universal joint back of the transmission through a propeller shaft surrounded by a torsion sleeve bolted at its rear end to the axle casing. The axle is of the full floating type, annular ball bearings being used throughout including the hub bearings. A compact bevel gear differential is used having four pinions.

Following the usual Chalmers-Detroit practice, one transmission brake, actuated by a pedal, is provided immediately behind the gear case. One set of internal expanding brakes operated from a side lever are placed directly on the rear wheels. The placing of the foot brake on the transmission, the makers point out, has a number of advantages, among which may be mentioned: The increased braking power owing to the drum being geared

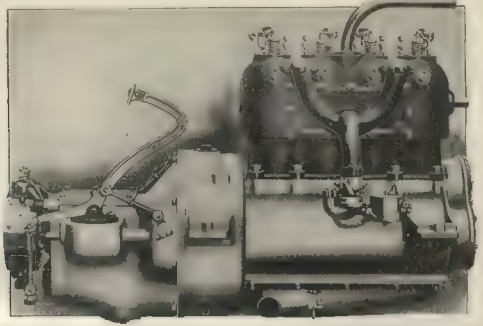


Fig. 3. Intake side of Chalmers Detroit 36" unit power plant Valve tappets and inlet valves are unusually easy An improved method is used of applying the oil screening and straining apparatus. The transmission brake is supported on the rear of transmission by suitable drop forgings. Hinged pedal pad is used on the transmission brake rod. Toggle motion from clutch and brake pedal to the clutch enables the operator to entirely throw out the clutch before the brake takes hold Studs, nuts, and lock-washers instead of bolts, are used for holding transmission case in place Same method of fastening is used on the cylinders.

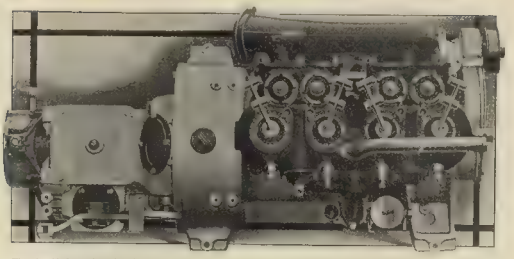


Fig. 4. Chalmers-Detroit "30" unit power plant from above. Note the accessibility of inlet and exhaust valves. Transmission and clutch compartments are also easy to get at in case adjustments are necessary. All moving parts except valve lifters and fan pulleys are enclosed.

up from the wheels; simplicity, cleanliness, the removal of weight from the axle and the consequent saving in tire wear; complete equalization of braking effort between the two wheels independently of the condition of the braking or the road surfaces. As against these advantages, only one disadvantage is cited, and that is the transmission of the braking effort through the rear axle driving mechanism. However, this mechanism must be amply strong to allow the motor slipping the rear wheels under all conditions of load and road surfaces.

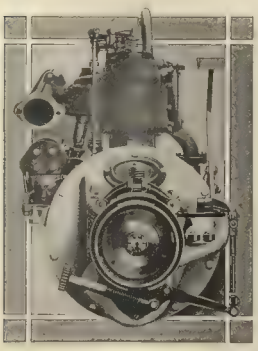


Fig. 5. Rear of Chalmers-Detroit "30" motor showing the transmission service brake. Note the ease of adjustment by means of the knurled hand wheel at the left, also the substantial manner in which the brake is mounted.

The braking effort can't possibly exceed this, in fact, must always remain somewhat less. A brake placed on the transmission can therefore never strain the driving mechanism quite as much as the motor itself is capable of doing, but it must be remembered that what strain and wear it does bring is in addition to that brought by the motor.

The steering gear remains exactly as it was during the past year. The shifting mechanism has been improved by inclosing it hermetically in separate casings. The frame has been dropped behind the front seats so as to lower the rear foot boards and the center of gravity of the whole car. The upper and lower flanges have been very much widened to give extreme stiffness, thus relieving the mechanism and body from severe strain.

34x3½ tires are being fitted for 1910 as against 32x3½ for 1909.

All spring shackles and other working parts are provided with generous grease cups and remarkable care has been exercised to effectively and neatly lock all running gear nuts and bolts.

The general appearance of the car has been improved by lengthening the wheel base and body. The hood has been raised and lengthened to conform to the increased size of the car. The wheel base is 115 inches as against 110 inches last year, the tread remaining standard, though a 60 inch tread will be option on cars going to the South.

### THE "FORTY."

The Chalmers-Detroit "Forty" model will incorporate very few changes mechanically from last year's construction, although the wheel base has been greatly lengthened and the touring body enlarged to make room for seven passengers.

The motor will continue to be 5x4¾, with inlet and exhaust valves all on one

side; a three plain bearing crank shaft, and a circulating oiling system.

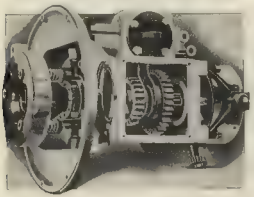


Fig 6. Clutch and transmission of Chalmers-Detroit "Forty." The clutch, transmission, and brake may be removed without disturbing other parts. Clutch spring may be adjusted through oval hand hole in clutch case. The clutch throw-out collar is fired with a friction band forming a brake and stopping the spinning of clutch when thrown out. Attention is directed to the anchorage of service brake. Conical clutch pressure plate has the rim turned up at its greatest diameter making it more rigid and insuring even pressure on clutch plates

The leather faced cone clutch itself remains practically unchanged, but the operating mechanism has been modified so that the pressure on the pedal required to throw it has been reduced to about one-third of the former pressure.

TRANSMISSION CHANGES

The gear box has been changed by placing the lay or counter shaft underneath the through shaft instead of above it as in the past. The transmission this year will be mounted throughout on annular ball bearings. A double universal joint drive has been retained, the torque being now taken up by a triangular arm instead of a single lever. The rear axle will be of pressed steel, autogenously welded along the neutral axis giving the greatest possible amount of strength for a given weight, so much so that no strut rod is considered necessary. The frame has been dropped as in the "30" under the side doors. The upper and lower flanges of the frame have been made very much deeper following the best European practice. This insures a rigid foundation for the body, preventing the binding of doors, etc., so frequently met with. A honeycombed radiator has been substituted on the "Forty" for one of the vertical tube type. The axle is of the full floating type with bevel gear differential. No brace is used under this axle.

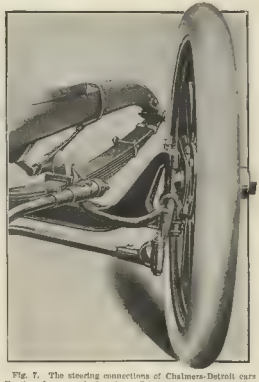


Fig. 7. The steering connections of Chalmers-Detroit cars Front axles are single piece, I-beam, drop forged Note drop in steering cross rod.

The "30" is furnished in touring car, pony tonneau, and roadster at $1,500; as an inside drive coupe for $2,100, and as a limousine and landaulet for $2,750. All styles of the "Forty"—touring car, pony tonneau, and roadster are $2,750, except that $75 additional is asked for two extra seats in the touring car.

Fig 8 Chalmers-Detroit rear axle, showing accessibility of parts This axle is of the full floating type, wheels clutch driven as shown

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The Pittsburgh Motor Vehicle Company takes this opportunity of advising the trade that it is still doing business as usual in Pittsburgh, Pa., and intends to continue so doing and has not moved to Washington, D. C., as was circulated in a false report and published by certain trade papers.

# Burden's "New" Horseshoes

Extra Light, Front

## EXTRA LIGHT

### Front

| Nos..... | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Wt. Ea. oz. | 11 | 13 | 15 | 18 | 22 | 27 | 32 |
| No. in Keg. | 146 | 123 | 107 | 89 | 73 | 59 | 50 |

### Hind

| Nos..... | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Wt. Ea. oz. | 10 | 11 | 13 | 16 | 20 | 24 | 29 |
| No. in Keg. | 160 | 146 | 123 | 100 | 80 | 67 | 55 |

100 pounds in a keg, or can be assorted Front and Hind in equal numbers

Extra Light, Hind

Light, Front

## LIGHT

### Front

| Nos..... | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Wt. Ea. oz. | 12 | 14 | 17 | 20 | 24 | 29 | 36 |
| No. in Keg. | 133 | 114 | 94 | 80 | 66 | 55 | 44 |

### Hind

| Nos..... | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Wt. Ea. oz. | 10 | 11 | 14 | 18 | 22 | 27 | 32 |
| No. in Keg. | 160 | 137 | 114 | 88 | 73 | 59 | 50 |

100 pounds in a keg, or can be assorted Front and Hind in equal numbers

Light, Hind

Medium, Front

## MEDIUM

### Front

| Nos..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Wt. Ea. oz. | 17 | 20 | 25 | 29 | 35 | 42 | 49 |
| No. in Keg. | 94 | 80 | 64 | 55 | 46 | 38 | 33 |

### Hind

| Nos..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Wt. Ea. oz. | 14 | 16 | 20 | 24 | 29 | 34 | 38 |
| No. in Keg. | 114 | 100 | 80 | 66 | 55 | 47 | 42 |

100 pounds in a Keg, or can be assorted Front and Hind in equal numbers

Medium Hind

# Burden's "New" Horseshoes

Heavy, Front

## HEAVY

### Front

| Nos. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Wt. Ea. oz | 19 | 2[illegible] | 27 | 33 | 39 | 46 | 52 | 57 |
| No. in Keg | 84 | 6[illegible] | 59 | 48 | 41 | 34 | 30 | 27 |

### Hind

| Nos | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Wt. Ea. oz. | 15 | 18 | 23 | 27 | 32 | 37 | 38 | 49 |
| No. in Keg | 106 | 88 | 70 | 59 | 50 | 43 | 42 | 33 |

100 pounds in a Keg, or can be assorted Front and Hind in equal numbers

Heavy Hind

Long Heel, Light, Front

## LONG HEEL, LIGHT

### Front

| Nos. | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Wt. Ea. oz. | 20 | 22 | 27 | 32 | 38 |
| No. in Keg | 80 | 73 | 60 | 50 | 42 |

### Hind

| Nos. | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Wt. Ea. oz. | 19 | 20 | 24 | 29 | 36 |
| No. in Keg | 78 | 73 | 68 | 55 | 44 |

100 pounds in a Keg, or can be Assorted Front and Hind in equal numbers

Long Heel, Light Hind

New Easy, Front

## NEW EASY

### Front

| Nos. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Wt. Ea. oz. | 12 | 14 | 18 | 22 | 25 |
| No. in Keg | 133 | 114 | 90 | 80 | 64 |

### Hind

| Nos | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Wt. Ea. oz. | 10 | 12 | 15 | 18 | 21 |
| No. in Keg | 160 | 133 | 107 | 90 | 73 |

100 pounds in a Keg, or can be Assorted Front and Hind in equal numbers

New Easy, Hind

# Cowboy Horseshoes

Cowboy, Plain

| No. | Weight of Each Shoe, Oz. | Average Number in Each Keg |
|---|---|---|
| 00 | 8 | 200 |
| 0 | 9 | 177 |
| 1 | 11 | 145 |
| 2 | 13 | 123 |
| 3 | 15 | 106 |

Cowboy, Calked

| No. | Weight of Each Shoe, Oz. | Average Number in Each Keg |
|---|---|---|
| 00 | 8 | 200 |
| 0 | 9 | 177 |
| 1 | 11 | 145 |
| 2 | 13 | 123 |
| 3 | 15 | 106 |

100 Pounds in a Keg

# Mule Shoes

| No. | Weight of Each Shoe Pounds | Weight of Each Shoe Ounces | Average No. in Each Keg |
|---|---|---|---|
| 1 | .... | 11 | 145 |
| 2 | .... | 13 | 123 |
| 3 | .... | 15 | 107 |

| No. | Weight of Each Shoe Pounds | Weight of Each Shoe Ounces | Average No. in Each Keg |
|---|---|---|---|
| 4 | 1 | 2 | 90 |
| 5 | 1 | 6 | 73 |
| 6 | 1 | 13 | 55 |

# Juniata Horse Shoes

(Iron or Steel)

## EXTRA LIGHT

| Front—Size | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| Weight, oz. | 10 | 13 | 15½ | 18½ | 22 | 25½ | 30 | 39 |
| No. in Keg | 160 | 123 | 103 | 86 | 73 | 63 | 53 | 41 |
| **Hind—Size** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| Weight, oz. | 8 | 10½ | 13 | 16 | 19¾ | 23 | 27 | 31 |
| No. in Keg | 200 | 152 | 123 | 100 | 82 | 70 | 59 | 51 |

## LIGHT

| Front—Size | 00 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| Weight, oz. | 10 | 11 | 14 | 17 | 20 | 25 | 29 | 36 | 41 | 48 |
| No. in Keg | 160 | 145 | 114 | 94 | 80 | 64 | 55 | 44 | 39 | 33 |
| **Hind—Size** | **00** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| Weight, oz. | 7 | 9 | 12 | 15 | 18 | 22 | 27 | 31 | 35 | 40 |
| No. in Keg | 228 | 178 | 133 | 107 | 89 | 73 | 59 | 52 | 46 | 40 |

## MEDIUM

| Front—Size | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| Weight, oz. | 13 | 17 | 20 | 25 | 29 | 35 | 40 | 46 | 55 |
| No. in Keg | 123 | 94 | 80 | 64 | 55 | 46 | 40 | 35 | 29 |
| **Hind—Size** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| Weight, oz. | 10½ | 14 | 16 | 20 | 24 | 29 | 34 | 38 | 43 |
| No. in Keg | 152 | 114 | 100 | 80 | 67 | 55 | 47 | 42 | 37 |

## HEAVY

| Front—Size | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Weight, oz. | 18½ | 22 | 26 | 30 | 36 | 43 | 49½ | 55 |
| No. in Keg | 86 | 73 | 62 | 53 | 44 | 37 | 32 | 29 |
| **Hind—Size** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| Weight, oz. | 15 | 18 | 22 | 28½ | 33½ | 38½ | 47 | 51 |
| No. in Keg | 107 | 89 | 73 | 56 | 48 | 42 | 34 | 35 |

## SNOW

| Front—Size | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| Weight, oz. | 10 | 12 | 15 | 18½ | 23½ | 28 | 32 | 38 |
| No. in Keg | 160 | 133 | 107 | 86 | 68 | 57 | 50 | 42 |
| **Hind—Size** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| Weight, oz. | 8 | 10½ | 12½ | 16 | 19½ | 23 | 27 | 33 |
| No. in Keg | 200 | 152 | 128 | 100 | 82 | 70 | 59 | 48 |

## LIGHT MULE

Steel only

| Size | 00 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|
| Weight, oz. | 8 | 9 | 10 | 12 | 15 | 20 | 23 | 30 |
| No. in Keg | 200 | 178 | 60 | 133 | 107 | 80 | 70 | 53 |

# The Federal 1909 High-Wheel Cars

HUGH DOLNAR

The Rockford Automobile & Engine Company, Rockford, Illinois, U. S. A., offers for the season of 1909 a high-wheel, 2-passenger car, one model only, with folding top as shown in Fig. 1. This car is driven by a horizontal motor, 4-cycle, water-cooled placed crosswise of the car under the removable foot-board. The motor and gear box are supported on an angle steel sub-frame having its two side members revolubly mounted on the rear axle sleeves; this sub-frame has a forward long cross member, close in the rear of the motor fly-wheel, the cross member ends being jointed to brackets dropped down from each chassis frame side. This sub-frame carries the motor, gear box and propeller shaft all in alignment, with no universal joints. The drive is a bevel pinion on the propeller-shaft rear end engaging a bevel gear on a cross-shaft on which a spur pinion is fixed which engages a spur gear on the spur balance gear drum. The rear wheels are keyed on the tapered live axle ends

The motor cylinders are 4½ ins. bore, with 4 ins. piston stroke, nominal 14 H.P. The reduction ratio from the crank-shaft to the rear wheels is 5½ to 1, high gear, and 12 to 1 low gear, with 13 to 1 reduction for the reverse. This sub-frame construction gives a perfect alignment of the motive assembly with the wheels standing on a plane surface.

NOTABLE FEATURES

The motor is water-cooled, the power gives about 30 miles per hour on good roads, and on low gear can drive the car through deep sand or mud. The springs are full-elliptics with scroll heads. The entire propulsion assembly is carried on an angle steel sub-frame journaled in the rear on the axle sleeves and jointed at the front end of each sub-frame member to a chassis side frame bracket. The front end of this sub-frame is depressed to take the opposed cylinder motor, and the straight part of the sub-frame sides in the rear of the motor is stiffened by substantial side pieces of wood.

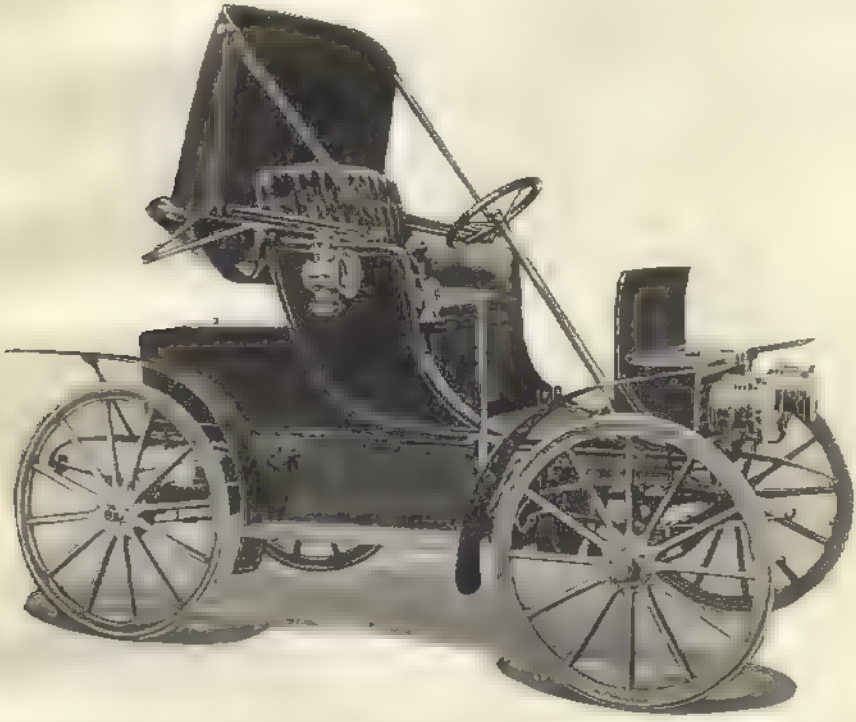


Fig. 1. Federal High-Wheel Car. Wheel base 80 ins. Gauge 56 ins. Tires either solid or pneumatic. The solid tires are 34 x 2½ ins. The pneumatic tires are 34 x 3½ ins. both front and rear. Motor 2 cylinders opposed, 4½ x 4 ins., 4 cycle, water cooled, nominal 14 H. P. The speed change is a sliding gear two forward speeds and a reverse with a propeller shaft bevel pinion to a bevel gear-driven cross shaft carrying a spur pinion meshing with a spur gear on the rear axle balance drum. One style of body only, with folding top and a single seat for two passengers. Weight, 1500 lbs. Price, $800.00 with solid tires, including 3 oil lamps, mat, horn and tools. Price with pneumatic tires, $900.00, same equipment.

rear. The cam-shaft is in a box which forms the crank-box cover and the timer is fixed to a vertical shaft journaled in this cover and spiral gear driven from the cam-shaft. The lower end of the timer shaft has fixed to it one pinion of a spur-gear oil pump, located in the bottom of the crank-box. Oil leads go from this gear pump to the crank-shaft journals and crank-wrists through holes drilled in the crank-box walls and in the crank-shaft itself. All oil holes are unobstructed and the crank-box lubricating oil level is not high enough to be touched by the connecting rod ends. The forced lubrication drip from the rod ends fills the crank-box and cam-shaft box with oil mist, caught in troughs to lubricate the cam-shaft bearings. With reasonably careful handling motor will give about 500 miles range on one gallon of lubricating oil.

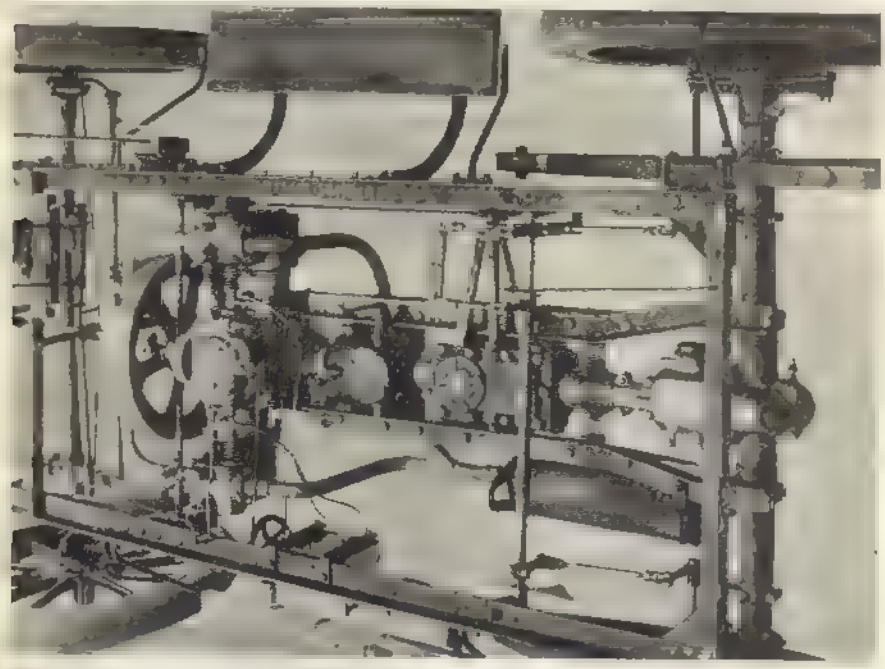


Fig. General chassis plan, showing general arrangement. The motive assembly has not universal joints to motor and gear-box, being carried on a sub-frame of angle steel stiffened by ash wood scantlings, 1½ ins. thick depth tapering from 2 ins. at rear to 5 ins. under the crank-shaft bearing, the sub frame sides being pivoted on the axle sleeves at the rear and jointed to the chassis dropped from the chassis frame in front.

Fig. Federal showing rear axle and spring and chassis frame rear construction as described in the text. The cantilevers of the motive assembly sub-frame sides have capped bearings on the rear axle steel tube sleeve pivots.

The crank shaft bearings and wrists are 1½ ins. dia., crank-shaft bearings 4 ins. long, wrists 1¾ ins. long, shaft and wrists in die-cast Parson's white bronze. The cast malleable iron connecting rods are 7⅝

The front wheels are on two circles of balls, ½ and ⅝ respective ball diameters, balls in adjustable 2-point bearings. The steering is by a wheel and right and left screw action. The live rear axles are in Hyatt roller bearings at both ends, with fibre and steel washers to take the side thrust. The speed change gear gives two forward speeds and a reverse, and all gears are hardened.

The brakes are internal expanding shoes in 12-in. diameter rear hub drums only. The brake shoes are fibre-faced. The clutch has 48 discs, 6 ins. effective outside diameter, brass and tempered steel alternated, in an oil-tight casing, splash lubricated. The ignition is by dry cells and jump spark plugs. The chassis frame is angle steel, 2 x 2 x ¼ ins., horizontal member below and vertical member outside.

THE FRONT AXLE

The front axle is a steel tube, straight 1⅝ dia., 3-16-in. walls with steel drop-forging stub axle yokes pinned and brazed to the tube ends. The yoke opening is 4 11-16 ins. The yoke pins, ⅝ dia., are steel hardened and ground, in phosphor bronze bushings, load carried on a phosphor bronze washer. The stub axle greatest ball-cone seat diameter is 1¼ ins.

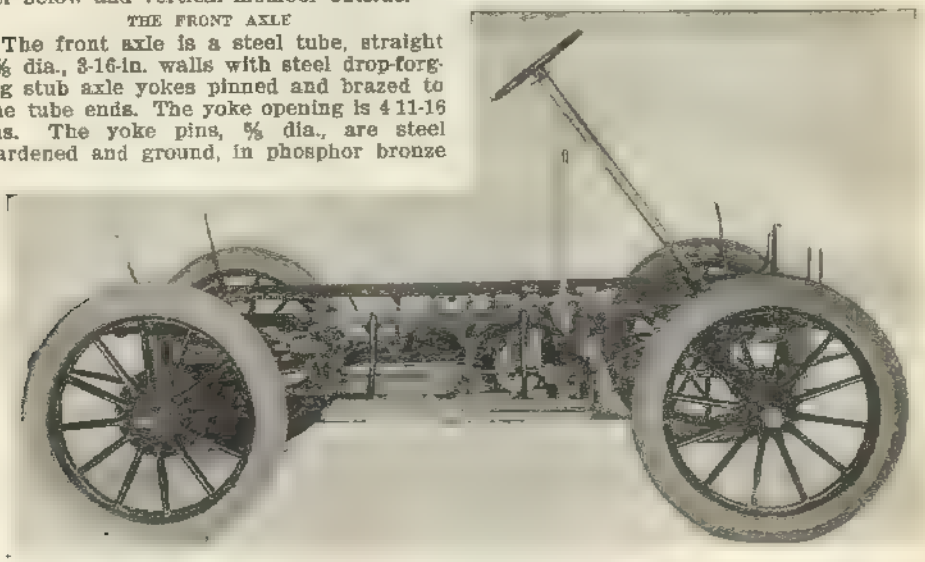


Fig 2. Federa. chassis right side elevation. The photographs were from a chassis fitted with pneumatic tires. There is only one outside lever placed at the driver's right, latched and used to effect the sliding gear shift. The rear hub brake drums are just now in process of change from 8 ins. inside dia. x 1½ ins. face to 11½ ins. inside dia. x 2 ins. face. The wheels all have 12 spokes each. 1¼ in. spoke thickness at the hub flange. The flanges are 7½ ins. dia. retained by 8 bolts each, ⅜ dia. The wheel base is 80 ins. and the tires are 34 x 3½ ins., car weight 1500 lbs.

THE REAR AXLE

The rear axle casing tubes are 2½ ins. outside dia., 3-16 walls, with malleable cast iron brake covers shrunk and riveted on the outer ends and the manganese bronze spur-gear housing hubs shrunk and riveted to the inside sleeve ends. Steel band reinforced and retaining rings are shrunk on the outside ends of the bronze gear-casing hubs and the axle sleeve rivets go through the bronze hub walls, the steel reinforce-rings and the sleeve tubes.

The sub-frame rear ends are revolubly mounted on the axle sleeves, and are capped, caps retained with ⅜ studs having hex. nuts on lock-washers.

The live rear axles, steel, are 1¼ ins. dia., balance gear hubs and outer axle ends in Hyatt roller bearings, rear wheel hubs keyed on the live-axle tapered outer ends and hex-nut retained.

THE SPRINGS.

The front springs are 36 ins. long x 1½ ins. wide, full elliptic, 4 sleeves top and bottom, tongued and grooved, button head in front and scroll end and links in rear. The lower members are fixed to perches pinched and pinned to axle tube. The top members are under steel drop forging bolsters held up to the chassis frame under side with clips and 7-16 nuts.

The rear springs are 40 ins. long, 1½ ins. wide, 4 leaves, tongued and grooved, scroll heads at both ends and are clipped to fixed perches, pinched on the rear axle housing sleeves, top member clamped to hangers riveted to the under side of the chassis frame. The rear spring members are linked together at both ends, the driving axle torque being resisted by the sub-frame as hereafter specified.

THE CHASSIS FRAME.

This is of angle steel 2 x 2 x ¼ ins. horizontal member below and vertical member outside. The chassis frame is 84 ins. over all length, 33⅜ ins. uniform width. Two cast malleable iron brackets are dropped 6¼ ins. below the chassis frame under side to take the sub-frame trunnions. The steering post base is fixed to a bronze plate bolted to the top of the chassis frame lower member and braced crosswise with a tie rod.

THE MOTOR.

The opposed cylinders, 4½ x 4 ins., have integral water jackets, thermal circulation of cooling water, motor 4-cycle, 85-lb. flywheel in front and multiple disc clutch in

cept for the piston and cylinders, which are lubricated by a belt-driven mechanical oiler, two oil leads, oil delivery needle valve regulated.

Lubricating oil in the reservoir, R, Fig. 7, which does not communicate with the spur gear housing, is forced by a two-pinion oil pump through oil leads cored in the

There are two large pedals on the footboard, with a horizontal muffler cut-out pinion between them. The left-hand large pedal is pushed forward to disengage the multiple disc clutch. The right-hand large pedal is pushed forward to apply the rear hub drum brakes through an evener. The single outside lever, at the driver's right,

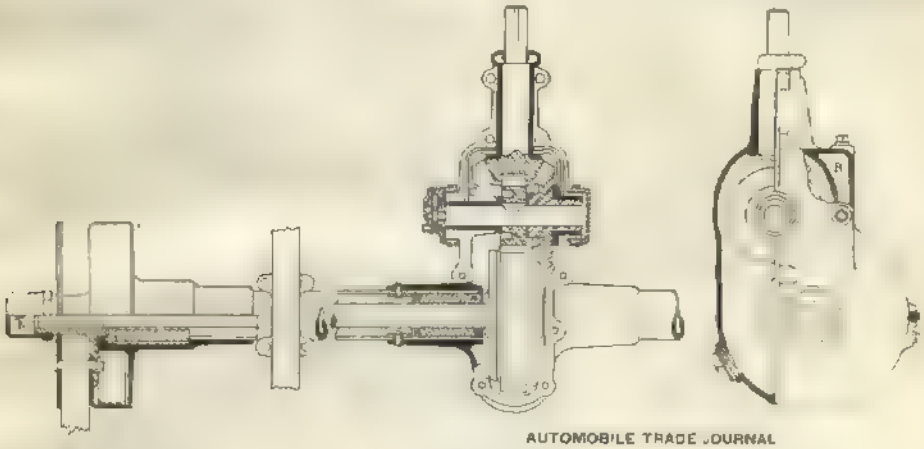



Fig. 7. Federal rear axle and housing construction. The Federal drive from the propeller-shaft is a steel pinion to a cross shaft bevel gear, 14 pinion teeth, 22 gear teeth. The cross shaft has fixed to it a 43 tooth spur pinion which engages a 45 tooth spur gear on the balance gear drum. The balance gear is a spur pinion arrangement. The 10 spur pinion carrying disc hubs have hexagon holes to engage the hex ends of the live axles. The internal shoe brake drums 8 ins. diameter changed to 8¼ ins. outside dia. This drive gives quiet work of the bevel gears, and a spur gear drive to the live axles with no gear end thrust on the axle shaft. All gears in the Federal chassis are cut by Browne & Sharpe automatic and are hardened.

housing walls to the rear end of the propeller shaft and to the two cross-shaft bearings. The main spur gear is lubricated by a pool in the bottom of the gear housing, this housing oil pool being filled

is latched and works in two planes to give the high gear, low gear and reverse.

The hand starting crank is in front and of usual construction, starting ratchet applied to the crank-shaft.

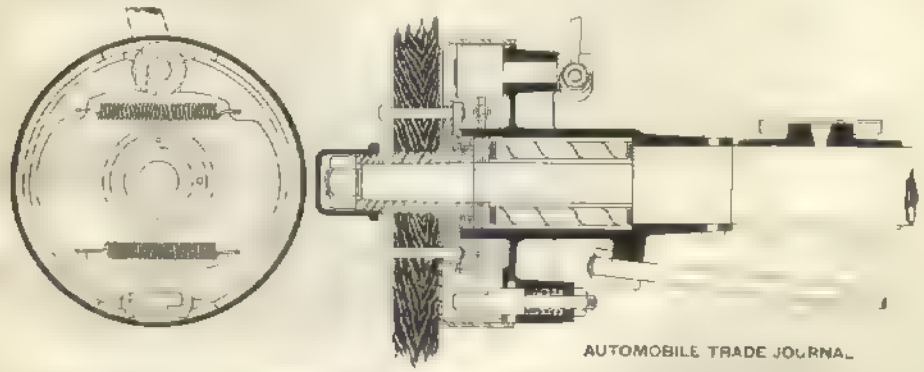



Fig. 8. Federal rear wheel hub and brake shoe construction. The brake shoe stud is two half-boxes expanded by a double wedge and screw and nut to compensate for brake shoe face wear. The brake shoes are cam rocker-expanded brake rockers moved through an evener. No brake other than these in the rear hub drums is fitted. The spoke thickness at the flanges is 1⅛ ins.; 18 spokes in each wheel, front and rear. The general construction is shown by the picture. The live axles are on Hyatt roller bearings.

through a screw plugged hole in the housing cover rear.

CONTROL.

The steering is by a hand wheel and a right and left screw thread action, the steering connection bearings being ball and socket with spring self-adjustment. The spark and throttle levers are on top of the steering wheel.

ON THE ROAD

The Federal car, weight 1500 lbs., motor nominal 14 H. P., can make about 30 miles on a good road, has 80 ins. wheel base, turns in about 28 feet, has full elliptic springs, front and rear, with scroll heads, and is really an easy riding car. The good roads range is about 18 miles to the gallon of gasoline and about 500 miles to the gal-

ins. c. to c. and are of the "scissors" type, as shown in Fig. 6. This is the first time the writer has seen this form of connecting rod which is very light, cheap in finishing and easily adjusted. The piston pins are 1⅛ dia. hardened and ground steel with ½-in. holes through them. The piston pins are fixed in the piston hubs, and the rod pin-bushes, phosphor bronze, have one flange screwed on to permit assembling. The wrist end of the scissors rod closes to hexagon form to take half-hexagon die cast white bronze boxes, clamped in place by one 9-16 bolt with a castellated hex-nut, pinched down hard on the half-box edges

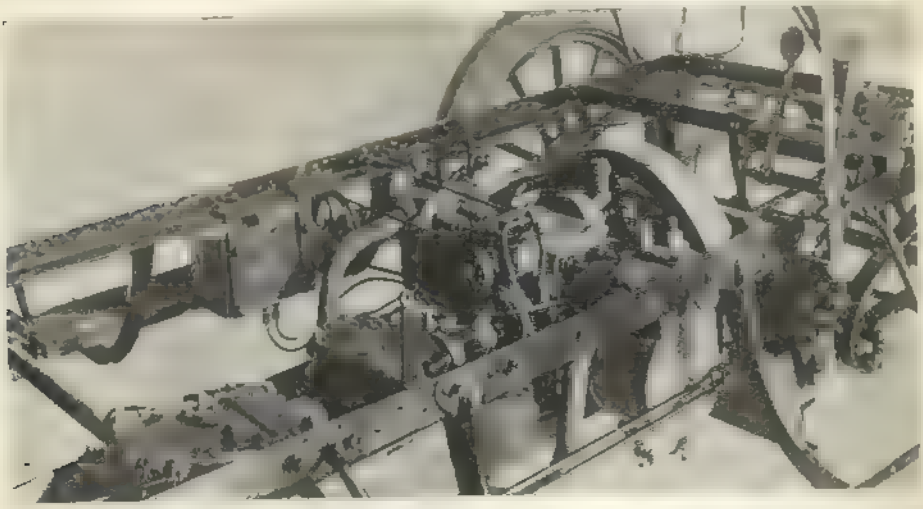


Fig. 5. Oblique aft vertical view of the motive assembly, mounted on a sub-frame which swings on the rear axle and is pivoted to cross front frame-side cast to a bracket dropped down from the chassis frame angle. It is a 4-point mounting, a steel bushed support at each corner of the rectangular angle steel sub-frame which carries the motive assembly. This sub-frame suspension is not hinged but with three wheels on the sleeve of the rear wheels, the motive assembly, which has universal joints at each end, is free to move with all points of the sub-frame as they pass over road irregularities. The sub-frame angle steel side members are stiffened by wood pieces underneath

Fig. 6. Federal motor details, "scissors" connecting rod construction. The Federal motor connecting rods are each made up of two members, nearly alike, cast malleable iron, which swing on the piston-pin bush, phosphor bronze with one integral flange and one screw flange to permit assembling. The jaws of these shear-blade like members are bushed to take half hexagon die cast white bronze boxes, the rod members being pinched together with one bolt and castellated hex-nut.

The clutch consists of 48 discs, tempered steel and brass alternating, 6 ins outside effective diameter, normally engaged by an enclosed coiled spring, and disengaged by pressure on the left pedal.

### THE CHANGE GEAR.

All change speed gears are hardened steel, 6-8 tooth, in a gray iron gear box with a removable cover. The side-shaft is directly below the line shaft, milled to hexagon section for the sliding gear member and all the bearings of the propulsion system are plain, and all except the motor bearings and wheel hubs are phosphor bronze bearings.

### THE REAR AXLE HOUSING.

The rear axle gear housing is of manganese bronze, divided horizontally above the axle sleeve hubs, in the place of the propeller shaft axis. The housing cap carries the propeller-shaft rear end and the bevel gear cross-shaft. The lower member of the rear axle gear housing has hubs to take the tubular live axle sleeves. In Fig. 7 is shown the construction details and method of lubrication, and in Fig. 8 is shown the rear wheel hub and brake construction.

Ignition is by dry cells, a 2-coil box and jump-spark plugs, all usual construction.

### LUBRICATION

The lubrication of this Federal motive system has been carefully considered, and is by forced feed through unobstructed oil leads, with oil return to oil reservoir, ex-

lon of lubricating oil. The control is simple and readily learned, with no liability of mishandling.

Thursday, March 11th, a Federal car, Adam Ziska, Federal factory superintendent, driver, and the writer as observer, left the Federal factory in Rockford and was driven over partly frozen clay roads to Westfield Corners, 7 miles, and return, 14 miles round trip. The first 5 miles out of Rockford this road is not very rough, and on this occasion had a dry, hard surface. On this fairly good road the Federal showed ready control, the short wheel base making the car very handy in meeting and passing and the full elliptics giving unexpectedly easy riding. The day was fair but cold, and at the end of the 5 miles of hard road surface clay hills, deep, soft mud frozen on top, were encountered, the last one, a long climb to Westfield Corners, being a very trying bit indeed of worst American roads. Our narrow solid tires cut through the frozen top crust and went down from six to ten inches to the clay bottom below. Mr. Ziska is, however, perfectly at home in the Federal car, and by dint of backing and ramming succeeded in climbing this impossible wet clay hill, in a manner wholly unexpected by the writer. The motor ran well, without more radiator heating than was to be expected from such a trial, and the return down this hill was made without much delay, though our narrow tires were often ten inches below the top surface of the mud, which obstructed the carburetor intake more than once. The particular car in which this very hard cold run was made has done about 4,000 miles since it was put on the road in August, 1908, most of it in this past wet winter, with no repairs save replacement of the connecting rod wrist babbitt boxes, destroyed by an inexperienced driver who tried to run without lubricating oil.

As before said, the Federal car is very handy, and is really easy riding, and the clay mud hill climbing stunt at Westfield Corners was far beyond what the observer believed any solid-tired high-wheeler could do. With pneumatic tires the wheels would have stayed on top of the frozen mud crust and we should have had no trouble in climbing this hill where single horses had all they could do to get up with a light buggy and one passenger.

## WORLD'S RECORD MADE AT MARDI GRAS

The three-day automobile race meet held in connection with the Mardi Gras at New Orleans was productive of one new world's record. Several track records were shattered also, and Ralph de Palma, driving a Fiat Cyclone, gained an enviable succession of victories.

In the matter of number of entries, the meet was somewhat disappointing, but lack of numbers was more than compensated by the class of cars and drivers which engaged in the competitions. Such well-known drivers as De Palma, George Robertson, winner of the last Vanderbilt Cup race; Lewis Strang, the Isotta's star pilot; Robert Burman and Jimmy Ryall shared the interest of the spectators with Mrs. Joan Newton Cuneo, who, piloting the Vanderbilt Cup racer, drove as fearlessly as the men.

De Palma recorded the longest string of victories, and he lowered some track records, but to Burman, in a special underslung Buick, must go the credit for establishing the only new world's record. The race was on Sunday, and the event was the 100-mile free-for-all. Burman's time was 1.42.39 2-5. The old record of 1.53.21 4-5 was made in a National in 1905.

## CONDITIONS FOR THE PRINCE HENRY TOUR

Rules and conditions for Germany's greatest motoring event of the year, the Prince Henry Tour, have recently been given out. The tour will be held from June 10 to 18 and will cover the following route: Start Thursday, June 10, Berlin, Breslau (speed trial); Friday, June 11, Breslau, Tatra-Lomniez, Tatra-Frued; Saturday, June 12, Tatra-Lomniez, Budapest; Sunday, June 13, general exhibition; Monday, June 14, Budapest, Vienna; Tuesday, June 15, general exhibition; Wednesday, June 16, Vienna, Salzburg; Thursday, June 17, Salzburg, Munich (two speed trials, finish Munich). The tour is open only to touring cars of from 7 to 28 H. P. with either 4 or 6-cylinder motors. The owners must be members of recognized international automobile clubs. The entrance fee is 500 marks. Only gasoline is to be used as fuel. Each car must have at least four seats, with double side entrance body, fitted with doors and must conform to police regulations. Two brakes must be fitted, muffler, and three lamps, of which one must be used for lighting the trials number. A spray must be fitted as well as ample mudguards. Speed indicators must also be fitted.

The entries close April 1st, with double fees up to May 1st, 6 P. M

All repairs must be made by the driver and no repairs must be made while the car is in motion or with parts other than those carried on the car.

## PELLETIER GIVES UP STUDEBAKER ADVERTISING

We are informed that Mr. E. Leroy Pelletier, advertising manager of the Everitt-Metzger-Flanders Co., Detroit, Mich., and the Studebaker Co., of South Bend., Ind., due to a breakdown in health from overwork, is relinquishing his publicity work in connection with the Studebaker product and will in the future confine his attentions solely to E. M F. advertising. He is at present taking a short vacation.

# Ashcroft Gauges

## FRAME FOR SETS OF INSTRUMENTS

**For Engine Room of Factories, Corporations, Mills, Water Works, Steamships, Etc.**

This cut represents one of many designs of an ornamental wooden frame on which to mount instruments The gauges shown above, having blind back connections, present a neat and attractive appearance. They cost according to size, design and finish Special metal frames and name plates to order. Orders should state whether blind back or the usual front bottom connections are wanted.

**For prices of instruments, see their respective lists on the following pages.**

# Ashcroft Gauges

**With Single Bourdon Springs of Solid Drawn Seamless Brass Tubing**
**Gauges Graduated by Open Mercury Column and Warranted Correct**
These Gauges are adapted for steam, air, gas, water and any fluid pressure that will not affect brass

## STEAM OR PRESSURE

Fig. 1202 A and 1202 B

### Fig. 1202 A–Iron Case, Brass Ring

| Diam. in. | Pressure Pounds | Each |
|---|---|---|
| 3½ | 30–60–100–160–200 | $ 7.00 |
| 4½ | 30–60–100–160–200 | 8.00 |
| 5 | 30–60–100–160–200–300 | 8 00 |
| 6 | 100–160–200–300 | 13 00 |
| 6¾ | 200 | 16 00 |
| 8½ | 200 | 22 00 |
| *10 | | 32 00 |
| *12 | | 50 00 |

### Fig. 1202 B–Brass Case, Brass Ring

| Diam. in. | Pressure Pounds | Each |
|---|---|---|
| 2½ | 30 | $ 8 00 |
| 3½ | 60–100–200 | 9 00 |
| 4½ | 100–200 | 10 00 |
| 5 | 100–200 | 11.00 |
| 6 | 100–200 | 16.00 |
| 6¾ | 200 300 | 20 00 |
| 8½ | 200–300 | 30.00 |
| *10 | | 40 00 |
| *12 | | 75 00 |

Prices Include Cock on All, except 2½ in. Size

All Pressure Gauges particularly when used under steam pressure should be graduated to double their working pressure to insure the greatest durability.

## VACUUM

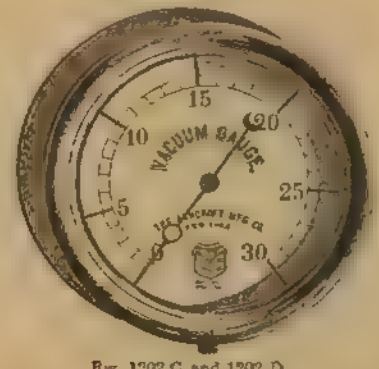



Fig. 1202 C and 1202 D

### Fig. 1202 C–Iron Case, Brass Ring

| Diam. in. | Each |
|---|---|
| * 3½ | $ 7 00 |
| 4½ | 8.00 |
| 5 | 8 00 |
| 6 | 13 00 |
| * 6¾ | 16 00 |
| * 8½ | 22 00 |
| *10 | 32 00 |
| *12 | 50 00 |

### Fig. 1202 D–Brass Case, Brass Ring

| Diam. in. | Each |
|---|---|
| * 3½ | $ 9 00 |
| * 4½ | 10.00 |
| * 5 | 11.00 |
| 6 | 16.00 |
| * 6¾ | 20.00 |
| 8½ | 30.00 |
| *10 | 40.00 |
| *12 | 75 00 |

Prices Include Cock

**No Gauge Warranted unless properly Connected with Siphon**

* Sizes not carried in Stock

# Ashcroft Gauges

## COMPOUND PRESSURE AND VACUUM

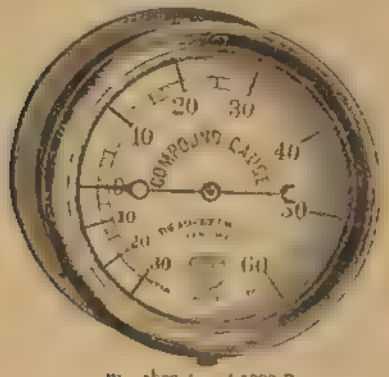



Fig. 1203 A and 1203 B

With Single Bourdon Springs of Solid Drawn Seamless Brass Tubing. All Gauges are Graduated by open Mercury Column and Warranted Correct

Dials Generally Graduated to 60 pounds pressure and 30 in. Vacuum

**Fig. 1203 A–Iron Case, Brass Ring**

| Diam. Dial in. | Each |
|---|---|
| * 3½ | $10.00 |
| * 4½ | 12.00 |
| * 5 | 14.00 |
| 6 | 16.00 |
| * 6¼ | 20.00 |
| * 8½ | 30.00 |
| *10 | 40.00 |
| *12 | 60.00 |

**Fig. 1203 B–Brass Case, Brass Ring**

| Diam. Dial in. | Each |
|---|---|
| * 3 | $12.00 |
| * 4½ | 14.00 |
| * 5 | 16.00 |
| 6 | 20.00 |
| * 6 | 25.00 |
| 8 | 40.00 |
| 10 | 50.00 |
| 12 | 80.00 |

Prices Include Cock

## HYDRAULIC

Fig. 1203 C and 1203 D

Springs up to 2,000 Pounds are made of Solid Drawn Seamless Brass Tubing. Springs over 2,000 Pounds are made from Solid Bar Steel, carefully bored out, bent to shape, tempered and tested

**Fig. 1203 C–Iron Case, Brass Ring**

| Diam. Dial in. | Pressure Pounds | Each |
|---|---|---|
| 5 | 500 | $12.00 |
| 5 | 1000 | 12.00 |
| *5 | 2000 | 30.00 |
| 6 | 500 | 20.00 |
| 6 | 1000 | 20.00 |
| 6 | 2000 | 35.00 |
| 6 | 5000 | 35.00 |

**Fig. 1203 D–Brass Case, Brass Ring**

| Diam. Dial in. | Pressure Pounds | Each |
|---|---|---|
| 5 | 500 | $16.00 |
| 5 | 1000 | 16.00 |
| *5 | 2000 | 35.00 |
| *6 | 500 | 40.00 |
| *6 | 1000 | 40.00 |
| *6¼ | 2000 | 60.00 |
| *8½ | 2000 | 80.00 |
| | 5000 | |

* Sizes not carried in stock

# Ashcroft Gauges

## LOCOMOTIVE, WITH DOUBLE SPRING

Fig. 1204 A and 1204 B

With improved Double Bourdon Springs of Solid Drawn Seamless Brass Tubing. The movements and springs of these Gauges are removed from all contact with back of case. The cases have elastic packing rings, making them moisture and dust proof.

**Fig. 1204 A–Iron Case, Brass Ring**

| Diam. Dial in. | Pressure Pounds | Each |
|---|---|---|
| *4½ | 300 | $10.00 |
| 5 | 300 | 11.00 |
| *5½ | 300 | 12.00 |
| *6 | 300 | 15.00 |
| *6¾ | 300 | 18.00 |

**Fig. 1204 B–Brass Case, Brass Ring**

| Diam. Dial in. | Pressure Pounds | Each |
|---|---|---|
| *4½ | 300 | $12.00 |
| *5 | 300 | 13.00 |
| *5½ | 300 | 14.00 |
| *6 | 300 | 18.00 |
| 6¾ | 300 | 22.00 |

## LOCOMOTIVE, WITH AUXILIARY SPRING

Fig. 1204 C and 1204 D

With Single Spring of Solid Drawn Seamless Brass Tubing, having an independent Auxiliary Spiral Spring applied to the free end of the Single Tube Spring, to overcome the natural tendency of the tube to permanently set

**Fig. 1204 C–Iron Case, Brass Ring**

| Diam. Dial in. | Pressure Pounds | Each |
|---|---|---|
| *4½ | 300 | $10.00 |
| *5 | 300 | 11.00 |
| *5½ | 300 | 12.00 |
| *6 | 300 | 15.00 |
| *6¾ | 300 | 18.00 |

**Fig. 1204 D–Brass Case, Brass Ring**

| Diam. Dial in. | Pressure Pounds | Each |
|---|---|---|
| *4½ | 300 | $12.00 |
| *5 | 300 | 13.00 |
| *5½ | 300 | 14.00 |
| *6 | 300 | 18.00 |
| *6¾ | 300 | 22.00 |

Price includes Cock and Coupling for each Gauge and Wooden Blocks to form Air Space Back of Gauge. Can be furnished graduated to any pressure up to 500 pounds

**No Gauge Warranted unless properly Connected with Siphon**

*Sizes not carried in Stock

# Ashcroft Deep Case Gauges

With Single Bourdon Springs of Solid Drawn Seamless Brass Tubing

## DEEP CASE STEAM

Fig. 1205 A–Brass Case, Brass Ring

| Diam. Dial in. | Each |
|---|---|
| 6¾ | $23 00 |
| 8½ | 33.50 |
| 10 | 44 00 |
| 12 | 80 00 |

## DEEP CASE VACUUM

Fig. 1205 B–Brass Case, Brass Ring

| Diam. Dial in. | Each |
|---|---|
| 6¾ | $23 00 |
| 8½ | 33 50 |
| 10 | 44.00 |
| 12 | 80 00 |

## DEEP CASE COMPOUND STEAM AND VACUUM

Fig. 1205 C–Brass Case, Brass Ring

| Diam. Dial in. | Each |
|---|---|
| 6¾ | $28.00 |
| 8½ | 43.50 |
| 10 | $54.00 |
| 12 | 85 00 |

## DEEP CASE CLOCK

Fig. 1205 D–Brass Case, Brass Ring

| Diam. Dial in. | Each |
|---|---|
| 6¾ | $45.00 |
| 8½ | 55 00 |
| 10 | 65 00 |
| 12 | 90.00 |

## DEEP CASE REVOLUTION COUNTERS

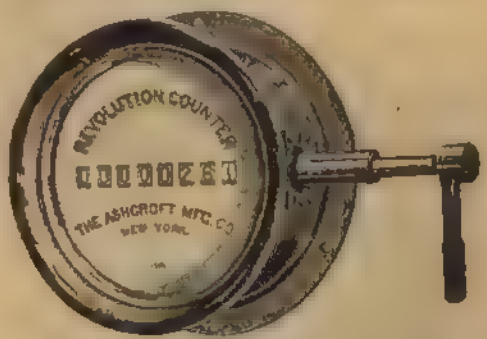



Fig. 1205 E–Brass Case, Brass Ring

| Diam. Dial in. | | Six Figures | Eight Figures |
|---|---|---|---|
| 6¾ | Each | $ 60.00 | |
| 8½ | Each | 70.00 | $ 80.00 |
| 10 | Each | 85.00 | 95.00 |
| 12 | Each | 100.00 | 110.00 |

# Ashcroft Gauges

**AMMONIA**

Fig. 1206 A and 1206 B

With Steel Springs for Ammonia, Acid or other Liquids or Gases that affect Brass

**Fig. 1206 A Iron Case and Ring**

| Diam. Dial in. | Each |
|---|---|
| 3½ | $25 00 |
| 4½ | 25 00 |
| 5 | 30 00 |
| 5½ | 30 00 |
| 6 | 35 00 |
| 6¾ | 40 00 |
| 8½ | 45 00 |

**Fig. 1206 B-Iron Case, Nickel Plated Ring**

| Diam. Dial in. | Each |
|---|---|
| 3½ | $25 50 |
| 4½ | 25.50 |
| 5 | 30.50 |
| 5½ | 30.50 |
| 6 | 35.50 |
| 6¾ | 40 60 |
| 8½ | 45 75 |

**No Gauge Warranted unless properly Connected with Siphon**

For Factory Shipment Only

# Square Case Revolution Counter

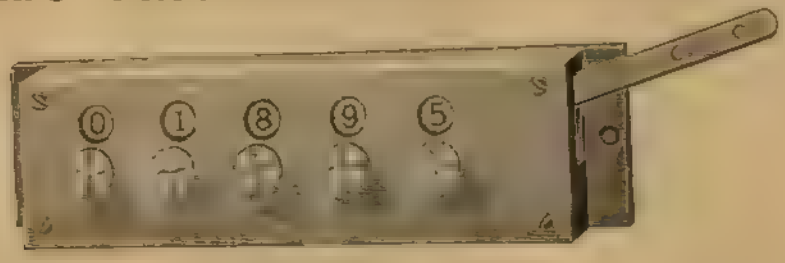



Fig. 1206 C

**Standard, Polished Brass Cases, Brass Dials, Steel Pinions, Ratchet, Wheel and Lever**

| No. | Each |
|---|---|
| 4–4¼x1 11/16x¾ in., Counts 10,000. Weight 18 oz. | $10.00 |
| 5–5⅛x1 11/16x¾ in., Counts 100,000. Weight 21 oz. | 12 50 |

# Hand Removers

Fig. 1206 D

| No. | Each |
|---|---|
| 1–Nickel Plated | $ 1.50 |
| 2–Nickel Plated | 3.00 |

# Steam Gauge Siphons

Fig. 1206 E

| | Each |
|---|---|
| Siphons–For ¼ in. Pipe | $ 0.50 |

road conditions on high gear, the speeds varying according to the makers from 5 to 75 miles per hour. A fan is driven by an adjustable wide belt to assist the radiator action.

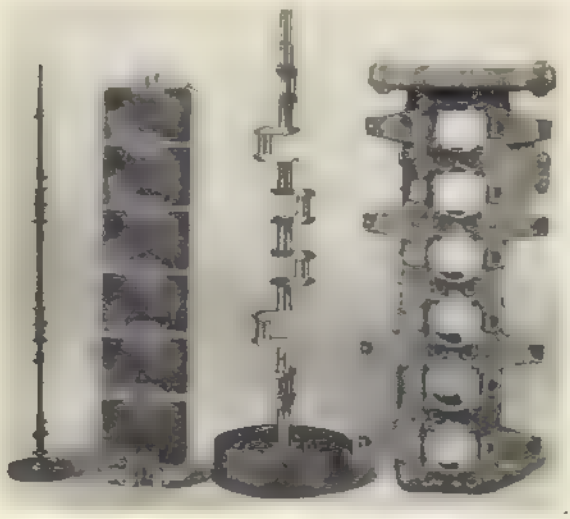


Fig. 5. View of the top and bottom of the Pittsburg Six crank case and the Krupp chrome nickel steel crank and cam shafts.

CONTROL AND STEERING GEAR.

The steering gear of the worm gear type is mounted on the sub-frame and is provided with ball bearings throughout, adjustable for wear. An 18-in. hand wheel is regularly furnished. Spark and throttle levers on steering wheel. Pedal clutch control, with foot brake levers and hand emergency brake levers are provided.

CLUTCH.

The Hele-Shaw multiple disc clutch of special design for the Pittsburg Six cars is used. Little more need be said of this clutch, which is a metal to metal proposition (hardened steel against bronze) running in oil, which makes it practically as proof against wear as the main bearings of the motor. The metal surfaces running in oil means that there is no clutch leather to burn out or harden, or to fail because of oil, or to be replaced through wear. In other words, the clutch stays in condition. Very easy adjustment is provided by means of one adjustment on the central spring, the single spring type of Hele-Shaw clutch being used. Gradual engagement is assured and the car can be easily and smoothly started on the second gear and can even be satisfactorily started on high gear, but does not slip when driving on any gear, at any engine speed. This clutch makes the car one of the smoothest to handle that could be desired and was adopted after other clutches had been thoroughly tried out.

THE CHANGE GEAR.

A sliding gear, selective type, three speeds forward and one reverse, with direct drive on third speed, is employed. Hardened chrome nickel steel and D. W. F. annular ball bearings are used. Warner Gear Co. selective change gear levers are mounted on the side frame member. A large inspection plate is fitted on top of the gear case and the case is tight and filled with lubricant. A sheet metal apron is provided to protect the motor and transmission.

REAR AXLE AND DRIVE.

Drive to the live rear axle is by a nickel-steel shaft with universal joints at both ends of the shaft, enclosed by a pressed steel housing and packed in grease. Live rear axle with bevel gear drive has always been used on the Pittsburg Six cars, and it has therefore not been necessary this year to change from a chain drive to the bevel gear. The rear axle ratio is 2⅝ to 1. Thirty-four-inch wheels are used this year instead of 36 in. as previously. The wheel base is 124 inches. Ten-inch road clearance is secured.

FRONT AXLE.

The front axle is of the I-section type, made from a one-piece drop forging, of Krupp steel. Large annular ball bearings are used on both front and rear axles. The steering connections are placed in the rear of the front axle.

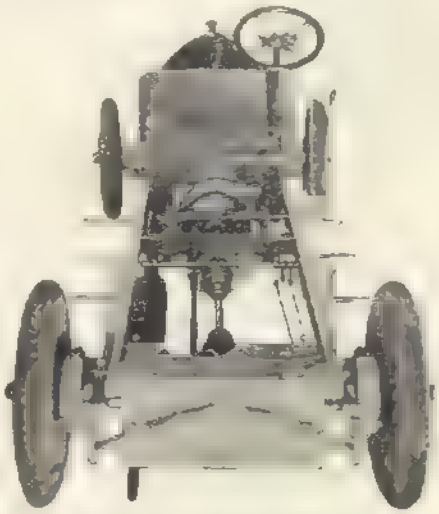


Fig. 6. Rear view of the Pittsburg Six 1909 model touring car chassis, showing the large platform springs, the strongly reinforced pressed steel frame and the large gasoline tank in the rear using exhaust pressure feed. 34 inch wheels are used and the wheel base is 124 inches.

BRAKES.

Four brakes in addition to the motor are provided in two independent sets. Two internal expanding shoes on the rear

hub drums, applied by pedal, and two external contracting band emergency brakes on the rear hub drums are applied by side hand lever. The clutch and brakes are not connected, on the grounds that the engine and both sets of brakes may be used at the same time if necessary; in other words, three sets of brakes may be used, without interference, by not connecting the brake levers and clutch in any way. Large surfaces are provided on the brake drums, which are 12½ in. in diameter and 2½ in. width. The brakes are metal to metal and either set of brakes has been proved ample to stop the car in a short space, or to hold it on the steepest incline yet encountered.

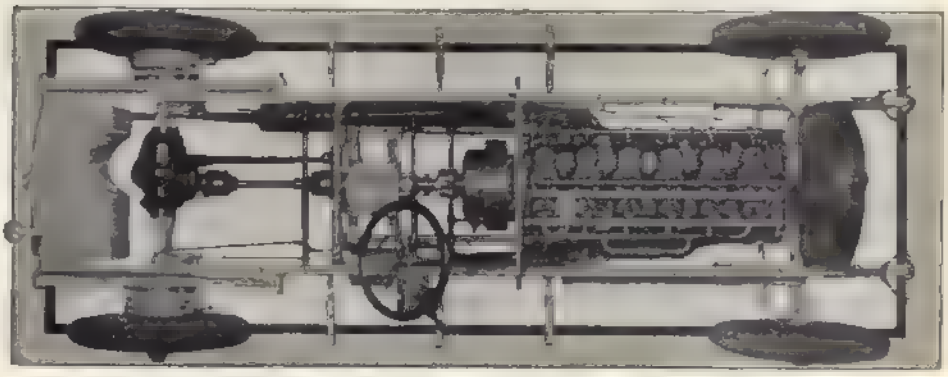


Fig 7. Plan view of the Pittsburg Six 1909 chassis. This view clearly illustrates the arrangement of the various members and their location in the frame.

SPRINGS.

Spring suspension is by semi-elliptic springs in front, while in the rear a platform three-point suspension is used on all models, giving a remarkably easy-riding car. All springs are 2 in. wide, front 42 in. long, rear (side) 44 in. long, (cross) 36 in. long.

Both the frame and engine sub-frame are of channel section pressed steel, amply reinforced by large gusset plates.

BODY

The bodies for the three models are made to the special order of the Fort Pitt Company from the very best selected woods obtainable, are specially reinforced and are upholstered and painted in the shops of the Fort Pitt Company.

The general design of the bodies follows the straight line principle. Model B roadster has individual front seats and disappearing rumble seat. Model C four-passenger tourabout has individual front seats and individual rear seats, while the Model D touring car has a seven-passenger body with two substantial revolving and folding extra seats which may be folded out of the way against the side of the car or entirely removed in a moment, and at the same time are substantial and comfortable additional seats. An unusually neat design for these extra seats to make the car carry seven passengers has been worked out by the manufacturers of this car. The hood or bonnet is of steel of the three-hinge type. The regular colors furnished are French gray and maroon

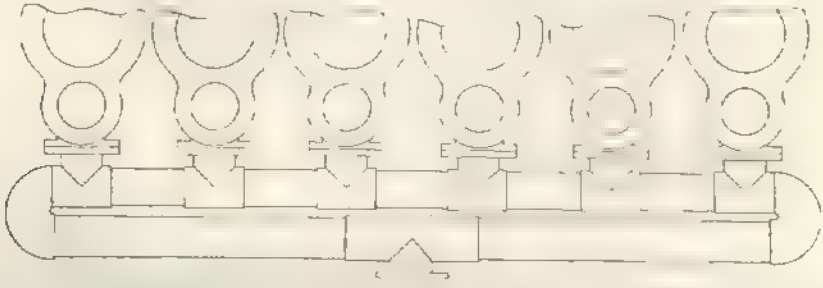


Fig 8. The new Pittsburg Six intake manifold, for which great results are claimed by the makers. It is intended that the gas for each cylinder shall be drawn from the carburetor, part of it following the loop in one direction and part in the other, thus causing the gas to travel the entire length of the pipe. This it is claimed is what happens for each cylinder, thereby giving an equal length of travel for the gas to each cylinder and therefore equal distribution.

running gears for the roadsters, blue body and light running gears standard for the touring cars. Black or red leather trimmings are used and special colors are furnished to order.

The Fort Pitt Company builds all the motors and various small parts for the cars in its shops at New Kensington, Pa., having the iron and aluminum castings made to special design and to its own patterns outside of its own shops. The cylinders, valves and cases are received in

lead the exhaust gases away from the cylinders without interference, being provided with a separate lead from each cylinder to the main pipe. This pipe for 1909 will be made of steel tubing autogenously welded, making a very light and strong construction. The timer for the battery system of ignition is mounted on a vertical shaft, and driven through bevel gears from the secondary shaft. The crank shaft is flanged for bolting on the fly-wheel. The engine may ordinarily be started on the battery without cranking, or on the magneto by cranking. The muffler is of the multiple unit pattern, and is remarkably efficient.

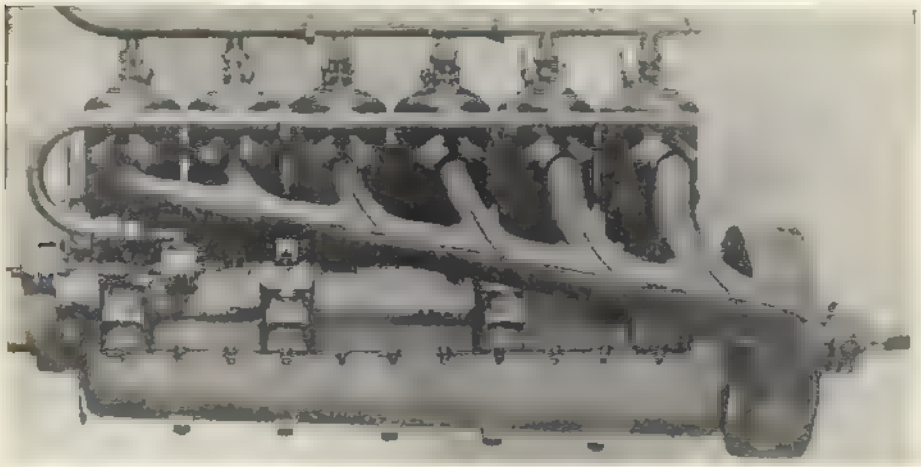


Fig. 1. Six cylinder motor of the 1909 Pittsburg Six, showing exhaust side, cylinders cast separately 4¾ inch bore and 5¼ inch stroke; 70 H. P., seven crank shaft bearings of white bronze, valves on opposite sides; spiral halftime gears; dual ignition. Note the design of the exhaust manifold arranged with increasing diameter.

IGNITION

A double system of ignition by jump spark is furnished. Sims-Bosch, Unterberg & Helme and Splitdorf high-tension magnetos are furnished at the option of the purchaser. An independent coil and storage battery system is furnished for starting, although the motor may be started successfully on the magneto under ordinary conditions. The two ignition systems are separate, two plugs being in the cap directly over each inlet valve. The wiring is of the best grade and encased.

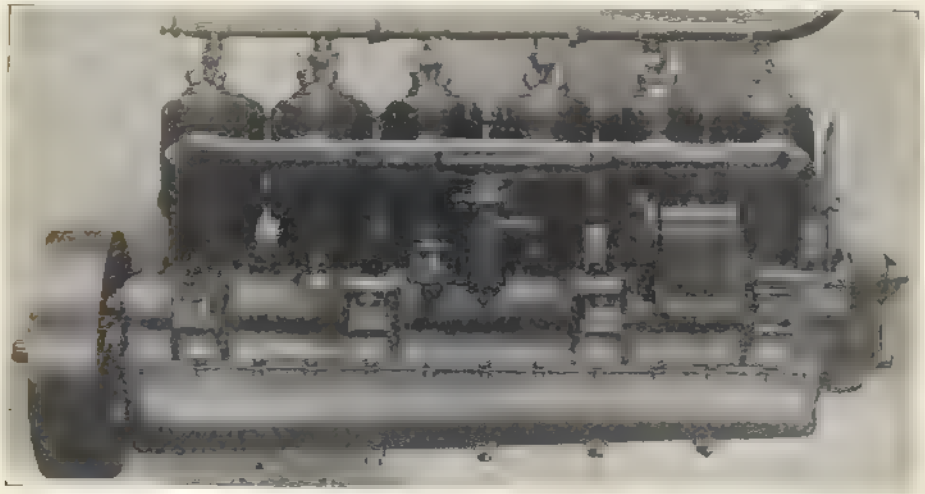


Fig. 2. Intake side Pittsburg Six motor, showing mounting of the magneto, location of the carburetor and the supporting arms of the crank case. Note the two spark plugs in each cylinder head. The inlet pipe shown has given place to a new design recently gotten out by this company and illustrated elsewhere in this article.

A NEW SIX-CYLINDER INLET PIPE.

A new inlet manifold for 6-cylinder motors has been designed to give a uniform supply of mixture to all cylinders and is connected to an automatic sight flow feed carburetor. This pipe, which is of very simple design, gives exactly equal lengths of pipe from the carburetor to all six cylinders,—and the same path for the gas

through the pipe for all cylinders of the motor,—regardless of the position of the cylinder. The usual flange connections to the cylinders are connected by a continuous long pipe to all cylinders as shown by the accompanying line drawing. At the first and sixth cylinders this continuous pipe is joined at the ends by return bends to a long pipe parallel to the cylinder connections. At the centre of the long pipe the carburetor connection is placed. This gives a looped piping in which the carburetor connection is included, which passes the six cylinders. The action of the pipe is explained as follows by the makers: The gas in leaving the carburetor travels in both directions along the auxiliary pipe to the cylinder requiring gas at any particular instant, i. e., the gas must travel the full length of the inlet pipe to reach any one cylinder, and this means that the gas travels the same distance as well as equal distance for all cylinders. As compared with the best known theoretically correct pipe heretofore used, the complete looped pipe described above is actually shorter in its total length. And while a long pipe is of necessity required for a 6-cylinder motor, it has been found that the extra length of pipe gives a reserve supply of gas and apparently allows much more rapid changes of motor speed.

Motor tests show surprising results. The company claims that on block tests the motor will run smoothly at lower speeds and at higher speeds than with any inlet manifold of types hitherto used for 6-cylinder motors; and better control is secured in rapid changes in motor speed,—all with lower gasoline consumption per mile than secured with manifolds previously used. On block tests 300 R. P. M. higher speed than before obtained was secured, and on the road from 4 to 5 miles an hour was added to the best previous speed. The new inlet pipe as described is not shown on cuts of the motor illustrated in this article.

Fig. 3. View of the cylinder, piston, connecting rod, magneto, and some of the white brass bearings of the Pittsburg Six.

GASOLINE FEED.

The Mercedes pressure system—pressure maintained in gasoline tank at three lbs. by exhaust pressure through regulating valve, while the engine is running—is used and a hand pump provided for emergency and starting pressure. This system gives a closed gasoline tank, under very slight pressure—automatically maintained while running, allowing the tank to be placed low in the rear of the chassis, and giving unvarying flow of gasoline to the carburetor, regardless of whether the car is going up or down hill, or on the level—the gasoline feed does not change. The gasoline tank is of 20 gallons capacity.

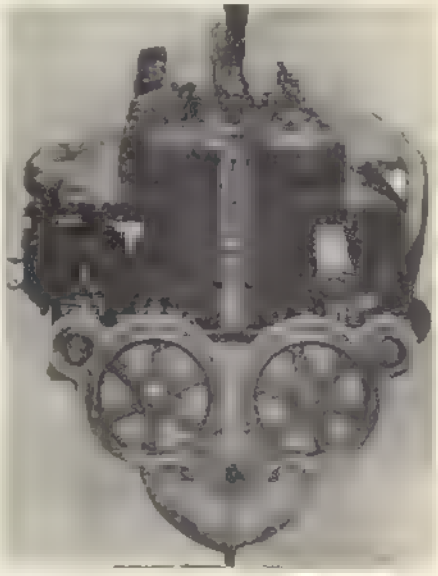


Fig. 4. Front end of Pittsburg Six motor, showing arrangement of the magneto and pump driven by spiral gears at the forward end of the engine.

RADIATOR.

A new honeycomb style radiator is used, of ample capacity to take care of low gear and second gear work, although the car is regularly driven almost regardless of

The 1909 Pittsburg Six cars, made by the Fort Pitt Motor Manufacturing Co., New Kensington, Pa., while following the general lines of the 1908 models, show some radical changes and refinements in detail which insure a place in the front rank of strictly high grade American-built cars.

The principle of design followed was to make a car with a simple, powerful and efficient power plant and transmission, giving at the same time all the requirements and controls necessary to a car that can be easily handled under all conditions.

The principal changes in the 1909 models are the use of the Hele-Shaw multiple disc clutch in place of the cone clutch formerly used, changed timing of motors, the use of Vanadium steel axles a new six-cylinder inlet manifold, and general improvements in the fine points of the car throughout its details.

Three models are placed upon the market this year: A three-passenger disappearing seat roadster completely equipped, except top, for $2,800. A four-passenger (individual seats) roadster at $3,000, and a seven-passenger touring car completely equipped, less top, price $3,250. All of these models have the same general chassis with the exception of the touring car, in which some frame changes are made to accommodate the large body. The motors are 6-cylinder, rated at 70 H. P.

MOTOR DETAILS

The 6-cylinder motor, Fig. 1, has cylinders cast separately with integral water jackets and valve pockets, bore 4¾ in., stroke 5¼ in. Cylinders are a high grade gray iron, bored and ground exactly to size. Crank shaft is of the seven bearing type, plain white-bronze bearings of large size being used throughout. Crank shaft, chrome-nickel steel, finished all over, hardened and ground to exact size. The inlet and exhaust manifolds are located on opposite sides of the cylinders; valves mechanically operated, inlet and exhaust valves interchangeable, valve lifters adjustable. Heads of the valves are all nickel steel, electrically welded to the mild-steel stems. Connecting rods are drop-forged, fitted with plain white bronze bushings, all of large dimensions. Crank case is of aluminum alloy cast in two parts, upper and lower halves, with the lower half forming reservoir for oil for splash lubrication. Separate aluminum castings are used to completely house the gears which are spiral, steel and bronze, running in oil. The engine is carried on a dropped sub-frame from the main pressed steel frame, giving an almost straight line drive. On the motor casing is mounted a Sims-Bosch magneto driven by shaft from secondary gears. On the opposite side of the motor is mounted a water pump of the Vane type and forced feed oil pump, also driven by shaft from the secondary gears. The magneto and pumps are therefore very accessible. Oil is maintained at a constant level in the crank case, an auxiliary oil tank being provided to keep up the level in the crank case and an auxiliary hand pump is provided for emergency.

A sight feed for determining the oil flow is mounted on the dash. The secondary shafts on opposite sides of the motor are enclosed in the crank case and oiled by splash lubrication. Four wide rings are fitted to each piston—pistons accurately ground and properly tapered.

Copper water pipes are used with ground union connections to cylinders; slip joints for expansion are provided. The exhaust pipe is a large cast iron manifold, tapering from the first cylinder to the muffler pipe, and so designed as to

the rough and finished in the shops of the company. All brass castings, however, are made in the foundry department, all painting and upholstering is done in the painting and upholstering departments of the factory, and all small parts and fittings are made in the machine shop at the factory. The cars, therefore, are not merely "assembled" cars, but the principal parts (the motors) are made in the factory, and all other parts are built of special material and to special order of the engineering department by some of the best manufacturers of these parts in the country.

The "Pittsburg Six" is, therefore, not in any sense an "assembled" car, but is manufactured and assembled in the shops of the Fort Pitt Motor Mfg. Co., New Kensington, Pa.

On the road in the Pittsburg district the Pittsburg Six has gained an enviable reputation by its performance, regardless of road conditions. The first 1909 stock model entered in the Providence races October 10th, without being stripped and absolutely without any previous try-out, won first place among strictly stock cars in the five-mile free-for-all, and came within two seconds of the winning French racer.

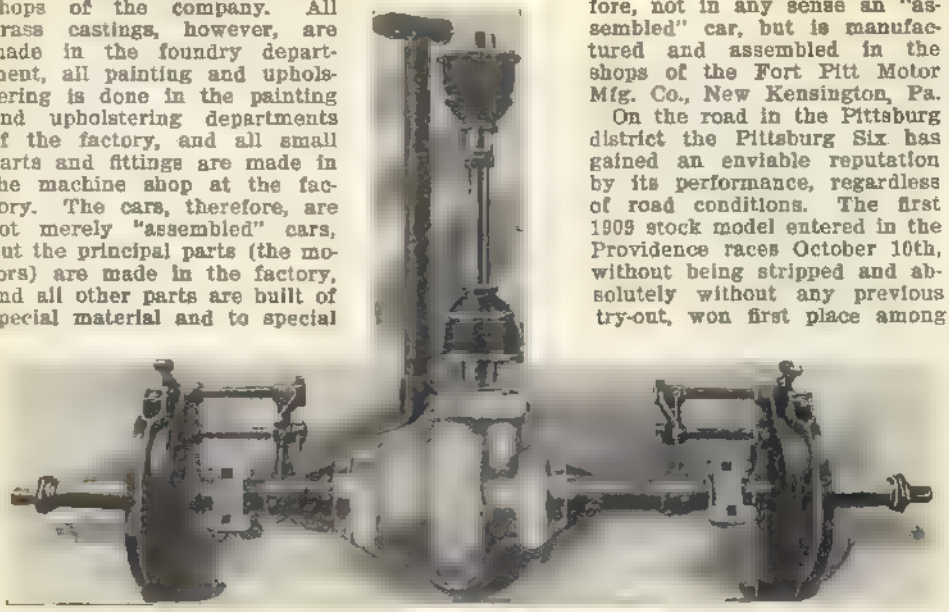
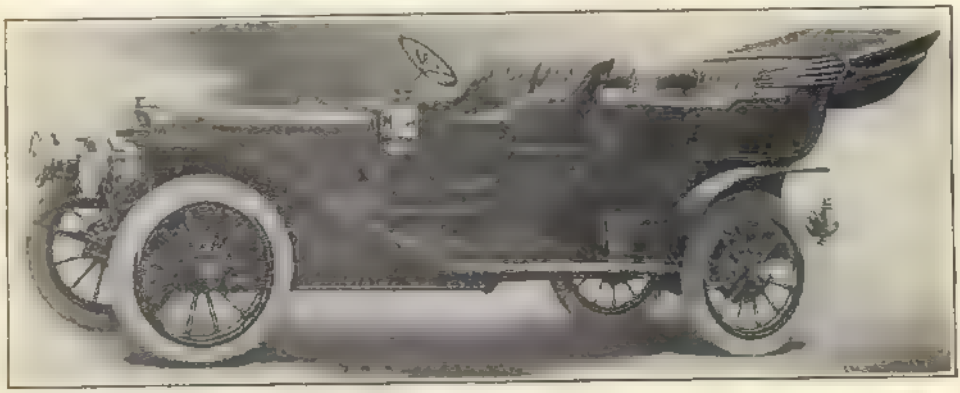


Fig. 9. Driving shaft rear axle and brakes of the Pittsburg Six 1909 model. This rear axle is of the live type and the brakes are [illegible] acting and [illegible] contracting on the same drum. The short shafts with arms at the ends mounted from fixtures on the rear axle housing allow the use of straight pull rods for the brakes. Two encased universal joints running in grease are used and a heavy torsion arm, as shown.

Mr. George Holloway, who for the past 16 years has been general superintendent of the Elmore Automobile Co., of Clyde, Ohio, has associated himself with The Vim Motor Mfg. Co., of Sandusky, Ohio. The above company make the well known "Vim" two-cycle marine motor and they purpose manufacturing a two-cycle automobile motor in the near future.

Through an enlargement just made of the factory of the H. H. Franklin Manufacturing Company at Syracuse, N. Y., new offices have been provided for the Engineering Department. These provide space double that formerly available and, with large windows along three sides, are better lighted than most drafting rooms among factories in general.



View of the new 60 H. P., 7-passenger Winton. This car is finished both as a runabout or as a [illegible] passenger touring car, as shown, for $4,500. Also as a Limousine for $5,750, or as a Landaulet for $6,000. It is powered by a 6 cylinder Winton motor [illegible] x 5 inches. The regular tire equipment is 4½ in Goodrich quick detachable front and rear [illegible] wheel base [illegible] 130 inches, and the road clearance is 11 inches. Other 1909 models described in the September 1908 issue page 85. This car, as other Winton models, has the self-starting feature.

# Metal Shades

## DEEP CONE

With Patent Holders

| No. | Each |
|---|---|
| 26—7 in., Polished Aluminum.. | $0 60 |
| 26—7 in.. Frosted Aluminum | 45 |
| 26 —7 in Frosted Steel | 5 |
| 26 —8 in. Polished Aluminum. | 80 |
| 26 —8 in Frosted Aluminum. | 65 |

## ROUND TOP CONE

With Patent Holders

| No. | Each |
|---|---|
| 53—Polished Aluminum. | $0 80 |
| 53—Frosted Aluminum.. | 65 |

## PLAIN PARABOLA

With Patent Holders

| No. | Each |
|---|---|
| 27 —7 in., Steel, frosted inside, green outside | $0 35 |
| 27 —7 in., Steel, frosted inside, Brush Brass outside | 50 |
| 27 —7 in. Steel, frosted inside, Nickel outside. | 50 |
| 27 —7 in. Polished Aluminum | 60 |
| 27 —7 in. Frosted Aluminum | 45 |
| 27—8 in., Polished Aluminum. | 80 |
| 27—8 in., Frosted Aluminum | 60 |

## DIMPLED PARABOLA

With Patent Holders

| No. | Each |
|---|---|
| 94—7 in., Polished Aluminum.. | $0 60 |
| 94—8 in., Polished Aluminum | 80 |

## FLAT CORRUGATED

For 2¼ in. Holder

| No. | Each |
|---|---|
| 60—12 in., Polished Aluminum | $1 00 |
| 60—14 in., Polished Aluminum | 1 20 |
| 60—16 in., Polished Aluminum.... | 1 45 |

For 3¼ in. Holder

| No. | Each |
|---|---|
| 60 12 in Polished Aluminum | $1 00 |
| 60—14 in., Polished Aluminum | 1 20 |
| 60—16 in., Polished Aluminum | 1 45 |

## PAPER SHADES

Green Outside, White Inside

Plain Paper Shade with Patent Holder

| No. | Per Doz. |
|---|---|
| 5— 8 in., Deep Cone | $3 50 |
| 6—10 in., Deep Cone | 4 00 |

Brass Bound Around Bottom. Patent Holder

| No. | Per Doz. |
|---|---|
| 5R— 8 in., Deep Cone | $4 80 |
| 6R—10 in., Deep Cone | 5 60 |

# Hubbell Shades and Reflectors

### FLAT SHADE

| No. | | Std. Pkg. | Per [illegible] |
|---|---|---|---|
| 5431— | 8 in., Flat Tin | 100 | $21 00 |
| 5432— | 10 in., Flat Tin | 100 | 25 00 |
| 5433— | 12 in., Flat Tin | 100 | 13 75 |
| 5456— | 14 in., Flat Tin | 5 Doz. | 7 80 |
| 5457— | 16 in., Flat Tin | 5 Doz. | 9 00 |

### DEEP CONE SHADE

| No. | | Std. Pkg. | Per 100 |
|---|---|---|---|
| 5440— | 8 in., Deep Cone Tin | 100 | $30 00 |
| 5441— | 10 in., Deep Cone Tin | 100 | 33 00 |
| 5442— | 12 in., Deep Cone Tin | 100 | 57 10 |

### PARABOLA REFLECTOR

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 5460 | [illegible] Polished Aluminum | 100 | $0 85 |
| 5461 | [illegible] Frosted Aluminum | 100 | 70 |
| 5477 | [illegible] Polished Aluminum | 100 | 85 |
| 5478 | [illegible] Frosted Aluminum | 100 | 70 |
| 5564 | [illegible] Frosted Tin | 100 | 55 |
| 5571 | [illegible] Brass | 50 | 75 |
| 5572 | [illegible] | 50 | 85 |

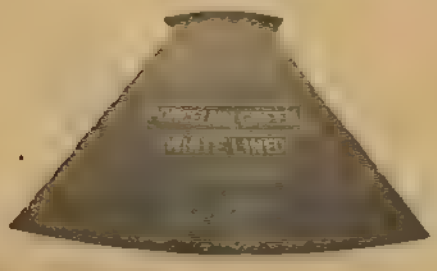
### HALF REFLECTOR

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 5429— | Half, Tin | 100 | $0 30 |
| 5430— | Half, Aluminum | 100 | 45 |
| 5591— | Half, Tin, Imitation Oak | 50 | 65 |
| 5592— | Half, Tin, Imitation Mahogany | 50 | 65 |

# Imported Porcelain Shades

Green Outside

### DEEP CONE



| No. | Size Holder | Per Doz. |
|---|---|---|
| 89— | 7 in. [illegible] | $ 6 60 |
| 90— | 10 in. [illegible] | 11 25 |

### HALF SHADE

| No. | Size Holder | Per Doz. |
|---|---|---|
| 91—Half Shade | 2¼ | $6 60 |

# Tin Shades

### FULL CONE

**Green Outside, White Inside**

| No. | | Per Doz. |
|---|---|---|
| 530 | — 8 in., 2¼ in. Holder | [illegible] |
| 532 | —10 in., 2¼ in. Holder | [illegible] |

### EXTRA DEEP CONE

**Green Outside, White Inside**

| No. | | Per Doz. |
|---|---|---|
| 527 | 7 in., 2¼ in. Holder | $3 00 |

### HALF SHADE

**Green Outside, White Inside**

| No. | | Per Doz. |
|---|---|---|
| 367 | —2¼ in. Holder | $3 00 |

### FLAT TIN

**Green Outside, White Inside**

| No. | | Per Doz. |
|---|---|---|
| 501 | — 8 in., 2¼ in. Holder | $1 75 |
| 505 | —10 in., 2¼ in. Holder | 2 25 |
| 509 | —12 in., 2¼ in. Holder | 3 00 |
| 513 | —14 in., 3¼ in. Holder | 4 25 |
| 515 | —16 in., 3¼ in. Holder | 5 50 |

### PORCELAIN ENAMELED STEEL SHADE

**Weatherproof, 1¾ in. Deep**

| No. | | Each |
|---|---|---|
| 940 | 15 in., for ¾ in. Pipe | $1 10 |
| 941 | 18 in., for ¾ in. Pipe | $1 30 |

# McCreary Reflectors

**Green Outside, Frosted Bottom**

| No. | | Each |
|---|---|---|
| 4 | —7 in., 3¼ in. Holder | $1 25 |
| | This Shade takes 10, 16, 20 and 24 C. P. Lamps | |
| 7 | —8 in., 3¼ in. Holder | $1 50 |
| | This Shade takes 10, 16, 20 and 24 C. P. Lamps | |

### EXTRA MICA DISCS

| No. | | Each |
|---|---|---|
| 220 | For either No. 4 or 7 McCreary Reflectors | $0 10 |

# Shades for Benjamin Clusters

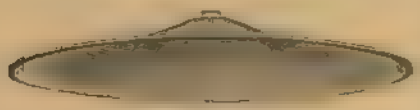
### TIN

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| T812 | 12 in. for Type K Cluster | 24 | $ .70 |
| T114 | 14 in. for Type 1, 7 or K Cluster | 24 | .80 |
| T214 | —14 in., for Type 2 Cluster | 24 | .80 |

### POLISHED ALUMINUM

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| A812 | 12 in. for Type K Cluster | 20 | $1 20 |
| A114 | —14 in., for Type 1, 7 or K Cluster | 20 | 1 60 |
| A214 | —14 in., for Type 2 Cluster | 20 | 1 60 |

### ENAMELED STEEL. W. P.



Tapped for $\frac{1}{8}$ in. Pipe

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| H15 | 15 in. | 20 | $2 00 |
| H18 | 18 in. | 20 | 2 50 |
| H20 | —20 in. | 20 | 3 00 |

### ENAMELED STEEL

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| H813 | 13 in. for Type K Cluster | 20 | $1 40 |
| H115 | —15 in., for Type 1, 7 or K Cluster. | 20 | 1 80 |
| H215 | —15 in., for Type 2 Cluster | 20 | 1 80 |

# Porcelain Shades

### FLAT

| No. | Diam. | Size Holder | Per Doz. |
|---|---|---|---|
| 255 | 6 in. | 2¼ in. | $2 60 |
| 255 | 8 in. | 2¼ in. | 3 40 |
| 255 | —10 in. | 2¼ in. | 4 00 |
| 255 | —12 in. | 2¼ in. | 5 60 |
| 255 | —14 in. | 3¼ in. | 7 00 |
| 255 | 16 in. | 3¼ in. | 11 00 |
| 255 | —18 in. | 3¼ in. | 15 00 |

### SCALLOPED

| No. | Diam. | Size Holder | Per Doz. |
|---|---|---|---|
| 256 | —6 in. | 2¼ in. | $2 60 |
| 256 | —7 in. | 2¼ in. | 3 00 |

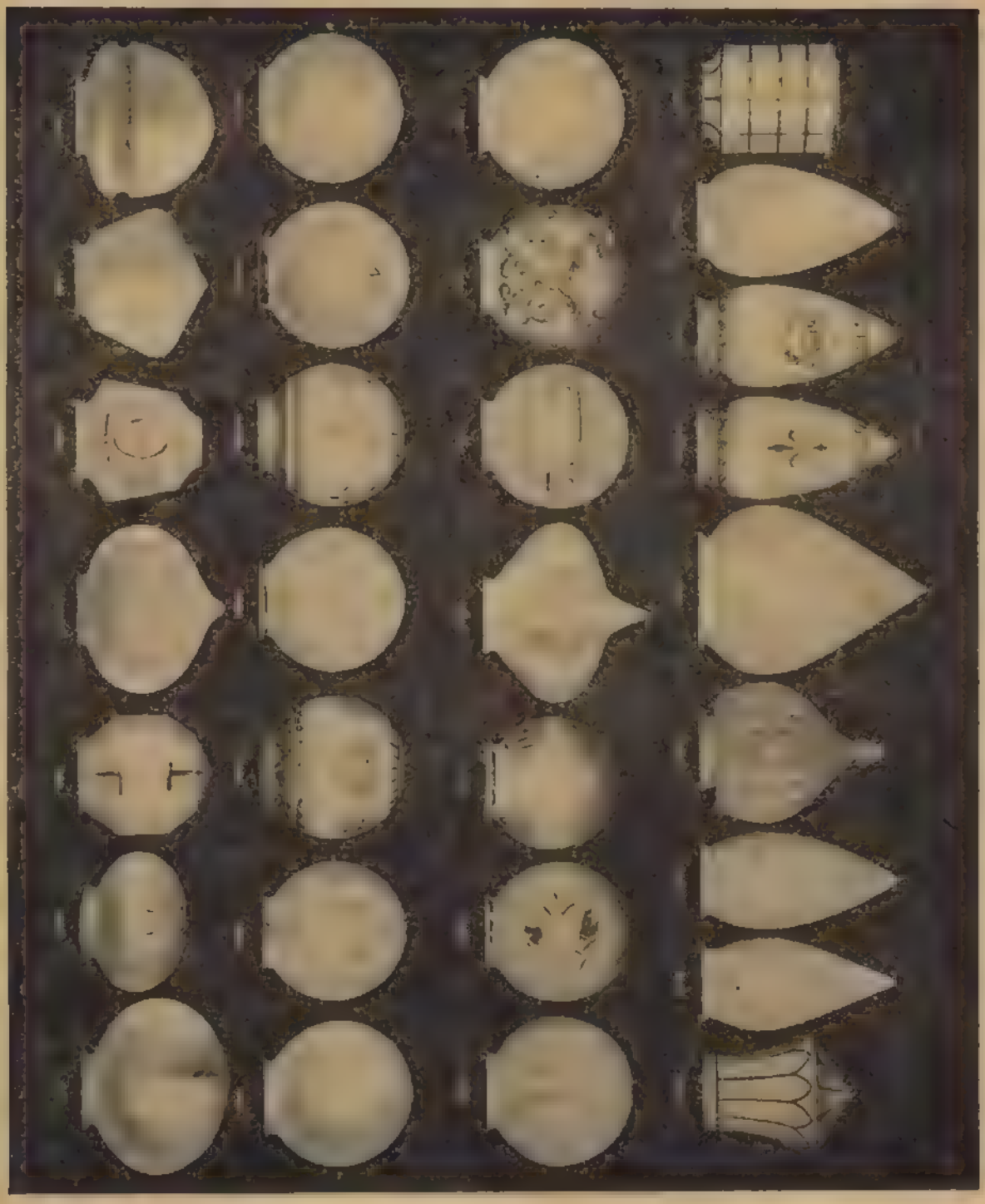
### FLAT FLUTED

| No. | Diam. | Size Holder | Per Doz. |
|---|---|---|---|
| 4251 | —6 in. | 2¼ in. | $2 60 |
| 4251 | —7 in. | 2¼ in. | 3 00 |
| 4251 | —8 in. | 2¼ in. | 3 40 |
| 4251 | —10 in. | 2¼ in. | 4 00 |

### DEEP CONE FLUTED

| No. | Diam. | Size Holder | Per Doz. |
|---|---|---|---|
| 4184 | —6 in. | 2¼ in. | $2 60 |
| 4184 | —7 in. | 2¼ in. | 3 00 |
| 4184 | —8 in. | 2¼ in. | 3 40 |

Glass Electric Shades



# Glass Electric Shades

**Price List of Shades Illustrated on Page 1185**

## CLEAR GLASS SHADES

| No. | | Per Doz. |
|---|---|---|
| E 3 | —Holophane Tungsten Reflector | see Page 1192A |
| E 5 | —Holophane Tungsten Reflector | |
| E 7 | —Holophane Tungsten Reflector | |
| E 9 | —Holophane Tungsten Reflector | |
| 173 804½ | —Cut Star | $12 10 |
| 173 09506½ | —Cut Star | $15 00 |
| 0304½ | —Clear Pressed Pattern | 3 10 |
| 4008½ | —Imitation Cut Star | 17 50 |
| 4031½ | —Clear Pressed Pattern | 11 50 |
| 09506½ | —Cut Star | 19 00 |

## ETCHED AND COLORED SHADES

| No. | | Per Doz. |
|---|---|---|
| U 118½ | —Tinted Edges | $ 8 00 |
| 591½ | —Clear Corners | 6 00 |
| 248½ | —Tinted Leaves | 11 50 |
| 3490½ | —Roughed Outside Satin Etched Corners | 10 40 |
| 390½ | —Tinted Edges | $ 9 60 |
| 2528 | —Leaded Glass Effect | 14 00 |

## ROUGHED INSIDE SHADES

| No. | | Per Doz. |
|---|---|---|
| 202 | —Roughed Inside | $ 7 20 |
| 317 | —Roughed Inside | 7 50 |
| 1110½ | —Roughed Inside | 11 40 |
| 4028½ | —Roughed Inside | $ 3 90 |
| 4944½ | —Roughed Inside | 7 20 |
| 8887½ | —Roughed Inside | 2 60 |

## STRAW OPALESCENT SHADES

| No. | | Per Doz. |
|---|---|---|
| 9835½ | —Straw Opalescent, Rib Roughed Outside | $10 80 |
| 9836½ | —Straw Opalescent, Rib Roughed Outside | $9 30 |

## DOME SHADES FOR ELECTRIC FIXTURES

| | | | Per Doz. |
|---|---|---|---|
| 36 | —Crystal, Roughed Inside, | Fringe not included | $ 9 00 |
| 36 | —Straw, Opalescent, Roughed Inside, | Fringe not included | 12 40 |
| 39 | —Crystal, Roughed Inside, | Fringe not included | 6 00 |
| 39 | —Straw, Opalescent, Roughed Inside, | Fringe not included | 10 85 |
| 594½ | —Roughed Inside, Clear Corners, | Fringe not included | 6 60 |
| 9071½ | —Roughed Inside, Clear Corners, | Fringe not included | 12 30 |
| 10033½ | —Etched Pattern | Fringe not included | 8 60 |

## BEAD FRINGE

| | Per Yard |
|---|---|
| Seed Bead Fringe, 6 in. wide, as illustrated on page 1185 | $ 1 60 |
| Cut Bead Fringe, 6 in. wide, Crystal, Green or Amber | 6 25 |
| Cut Bead Fringe, 6 in. wide, Ruby and Iridescent | 7 00 |
| Cut Bead Fringe, 6 in. wide, Iridescent with Green or Ruby Border | 8 00 |

is very staunchly built, for M. Esnault-Pelterie believes in having an apparatus which can stand the hard knocks that it is likely to receive.

BLERIOT MONOPLANE.

M. Bleriot is the pioneer of the monoplane, and he has spent years in bringing the machine to a satisfactory stage. The monoplane has a single main bearing surface with minor planes for balancing. The main planes spring out from a central body, in the fore part of which is mounted the motor and behind it the pilot. The single propeller is placed right in front of the machine, and this is of the tractor type. High speed is the characteristic of the monoplane and M. Bleriot's flight across the channel has proved the importance of this type. The minor plane at the rear has flexible tips which are under the control of the pilot; they act as rudders for controlling steering in an upward or downward direction. Further to the rear is the single rudder which steers from side to side. The motor used is the three-cylinder Anzani, and it is notable that M. Bleriot employs an engine of comparatively low horsepower. The machine is mounted on three wheels and is wonderfully compact and speedy.

SANTOS DUMONT MONOPLANE.

The first officially recorded aeroplane flight in Europe was made by M. Santos-Dumont, and on a machine of his own design. Thus he has had very great experience, and yet of late years he has not been able to equal his rivals in length of flight. He favors a very small machine—so small and compact that it can be packed upon a motor car—and he seats himself under the main plane with the engine above him. The Demoiselle, as his little flyer has been named, is most ingenious, and has made many short flights, but so far it has not shown as much stamina as the larger machines. In this machine Santos-Dumont gets away from the long central body which is so prominent a feature of the other monoplanes, but the position of the engine above the aviator is open to many objections. As an instance of how to build a flying machine with a minimum of material the Santos-Dumont monoplane is highly interesting. The design is to be considerably modified, but M. Dumont will still probably work on the assumption that most machines are needlessly bulky, and we may expect some highly interesting results.

ANTOINETTE MONOPLANE.

At first sight the similarity between the Bleriot and Antoinette monoplanes is considerable, but close examination shows that they differ in very many features. There is the usual main body with the main planes on each side of it. The bodies differ in shape and the Antoinette is notable for the manner in which the engine, radiators, or water-coolers, are mounted along the frame. A very powerful motor is fitted and this is of a special type in which the usual carburetor is dispensed with. The rear fins and planes are of unique design on the Antoinette and the rudder is in duplicate. At the rear of the main plane are flexible extensions which can be manipulated by the pilot. They serve to assist in the balancing of the machine. Another novel feature of the Antoinette is the mast, or spar, which rises up from near the center of the machine. From this cables extend to the main plane, bracing them very securely.

## $25,000 AERO RACE.

An aeroplane contest with financial rewards equalling the richest English turf prizes will result from the match race between Louis Bleriot and Hubert Latham when they meet in London the latter part of October. It was reported recently that the two men have placed a big side bet on the outcome. Besides this, there are two prizes of $15,000 and $8,000, the winner to take $12,000 of the former prize and the whole of the latter. These, with the side bets, will make the race worth close to $25,000.

There is intense rivalry between the two Frenchmen, owing to the fact that Bleriot was first to cross the English Channel in an aeroplane, after Latham had tried and failed.

## AVIATOR KILLED BY FALL

E. Lefebvre, the French aviator, who played a prominent part in the recent Rheims Aviation meet, was killed on Sept. 7, at Juvisy-Sur-Orge, France, by a fall while testing one of several new Wright aeroplanes which were being prepared for delivery. He was flying at a height of only 20 feet when the machine swerved sharply downward and struck the ground with great force. The cause of the accident is unknown but he had been known for his daring performances and reckless ness, and during one of the Rheims races he was fined for reckless flying.

Glenn Curtiss says apropos of military critical comparison between dirigibles and aeroplanes: "There are two things at present which are retarding long-continued high flights by aeroplane. The first is the nerve of the operator; the second, the fear that the motor will suddenly stop or develop other troubles that might make a quick descent from a high altitude dangerous. With the going of the motor troubles will come in the nerve of the operator."

Close view of Farman in his biplane with which he made his long flight at Rheims, France. This picture shows the hinged vertical rudders at the extreme rear forming a part of the box-like tail, the forward horizontal rudder or elevator is also shown as well as the hinged auxiliary planes at the outer ends of the main wings. This machine is fitted with both skids and wheels as shown.

## THE NATION HONORS THE WRIGHT BROTHERS

Because the first successful public flights of the Wright aeroplane, with the exception of the few flights made by Orville Wright at Fort Myer last year before his accident, were made in Europe, European powers were the first to have the opportunity of showering honors upon the inventors and European kings and presidents to personally congratulate them.

America, however, has now had her opportunity to personally express her admiration. On June 10 the brothers were received at the White House and President Taft conferred upon them the medals of the Aero club. On June 18 the nation's medal was presented to them at Dayton, Ohio. The obverse side has a profile of the Wrights, side by side, their names, the coat of arms of the United States and the words: "In recognition and appreciation of their ability, courage, and success in navigating the air." The reverse side bears an allegorical figure carrying a flaming torch and flying through the clouds above the surface of the earth. Above is a phrase from the Bible, "Shall mount up with wings as eagles."

The state of Ohio and the city of Dayton also presented medals to the brothers.

## ORVILLE WRIGHT PERFORMED AT BERLIN

Orville Wright made two successful flights over the Templehof parade ground at Berlin, Germany, on September 11. In the first he was aloft alone for forty-two minutes. A strong breeze was blowing. His second flight, with a passenger, Captain von Kehler, was of short duration.

## WASHINGTON AFTER AERIAL MEET

At a joint committee of the Chamber of Commerce and the Washington Aero Club recently it was decided to formally apply for the 1910 International Aviation Carnival to be held at Washington. The application will be made to the Aero Club of America.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## BRIEF DESCRIPTIONS OF THE MOST PROMINENT AEROPLANES

### WRIGHT BIPLANE.

The Wright Brothers were the first to build and successfully use the double-deck motor-propelled aeroplane, and their machine is the outcome of extensive trials with the Chanute type of double-deck gliding machine. The essential features of the machine are the double main planes, the duplex front rudder for up-and-down steering, and the duplex rear rudder for side steering. The engine drives two propellers through chain gearing. As the machine is mounted on sledge runners it has to be started by an auxiliary catapult-like apparatus running on a rail. This gives the machine its initial launching velocity, and the propellers do the rest. Balancing of the machine is obtained by warping the extremities of the main planes. The method of control is highly ingenious. It will be noted that the Wright is a tailless machine, while most of the French aeroplanes have tails. The Wrights rely mainly on the operator's control of the machine to preserve the balance when this is threatened with disturbance. It may be mentioned, however, that they have recently patented an automatic stabilizing arrangement.

### VOISIN BIPLANE.

This is one of the earliest types of French machines, and has many characteristic features. It differs from the Wright in that it has a tail with vertical panels which give a certain amount of automatic stability. Vertical panels between the main planes conduce to the same end. A single propeller is employed, driven direct from the engine. The machine is mounted on wire wheels, and thus can run along the ground to get its initial velocity before rising into the air. The rudder for vertical steering is a single plane, and the rear rudder is placed within the box tail. Of the Voisin it may be justly said that it is the parent type of the French school of biplanes, and it has developed to its latest form the plan of making the machine capable of being started without the aid of an auxiliary apparatus. The box tail and the supporting wheels add materially to the weight, but these attachments have very many advantages, and it does not seem that they will be readily abandoned.

### FARMAN BIPLANE.

Mr. Farman, a naturalized Frenchman of English parentage made his name in aviation on the Voisin machine. He then set up for himself and turned out an aeroplane of his own design. In many respects the Farman is like the Voisin, but there are numerous radical differences. Extensions to the main planes serve as auxiliary stabilizers. The machine is mounted on a combination of sledge runners and wheels whereby it can start in the manner of the Voisin, but can use the sledge runners when landing, and thus save the wheels from damage. A modified form of the box tail is employed on this machine, and there is also only one single elevating rudder, mounted far in front of the main planes. The operator is seated well forward, and the engine is placed immediately behind him whilst in many other machines it is situated beside the operator. This biplane has come to the front in remarkable fashion.

### CURTISS BIPLANE.

The machine designed by Glen H. Curtiss is in several respects a curious blend of the typical American and French machines, and yet the net result is a machine which can be readily distinguished from either. Like the French Biplanes it is mounted on wheels and thus can start without a special apparatus. Like the Wright it has a double rudder in front for vertical steering. Auxiliary stabilizing planes are fitted between the main planes. The machine is notable for its small bearing surface and its very light weight. An air-cooled engine is employed whilst most of the other biplanes use water-cooled motors. The front elevating plane and the rear rudder are mounted at considerable distances from the main planes. Nevertheless, material has been saved all round in such a manner that the total weight is little more than half that of some other machines. Mr. Curtiss differs radically from the Wright school, and has been designing aeroplanes and engines for several years.

### R E. P. MONOPLANE.

M. Robert Esnault-Pelterie has been experimenting with the monoplane for many years, and he has achieved no small measure of success, though he does not court publicity. His machine approximates to the Blériot in general outlines, but here again a wealth of detail differences are to be noted, every one of them of importance according to the designer. The machine is very strongly built and the whole design makes for compactness. The engine is of M. Esnault-Pelterie's own invention, and thus he is one of the few aviators who has designed the aeroplane and the engine and drives the resulting machine. At the tips of the main plane there are supporting wheels to prevent their being injured by rough contact with the ground. The elevating plane is mounted at the rear of the machine whilst the rudder for side-steering is placed low near the keel. There is a vertical fin for improving the stability. The whole machine

Paulhan making a successful turn during one of his flights at Rheims, France. This daring aviator, although comparatively a novice, handled his plane with skill and daring

before. He also made new speed records for distances over 80 kilometres. His times were as follows: 90 kilometres, 1 hr. 19 min. 56 2-5 sec.; 100 kilometres, 1 hr. 28 min. 17 sec.; 120 kilometres, 1 hr. 45 min. 32 sec.; 140 kilometres, 2 hr. 3 min. 54 sec.; 150 kilometres, 2 hr. 13 min. 9 3-5 sec. Another good flight was made by Blerlot, who, carrying a passenger, covered ten kilometres in 8 minutes and 38 2-5 seconds.

Several unsuccessful attempts were made by Paulhan on Friday to beat the distance record made on Thursday by Latham and his machine was damaged later on in the day. Farman succeeded in setting a new distance record of 111.85 miles making it in 3 hours, 4 minutes 56 2-5 seconds.

On Saturday the honors fell to America when Glenn H. Curtiss won the Gordon-Bennett cup. This cup is held for one year and is to be competed for annually. The results of this contest were as follows:—

1. Glenn H. Curtiss (America), Herring-Curtiss biplane, 15 min. 50 3-5 sec.
2. Louis Blerlot (France), Blerlot monoplane, 15 min. 56 1-5 sec.
3. Hubert Latham (France), Antoinette monoplane, 17 min. 32 sec.
4. Eugene Lefebvre (France), Wright biplane, 20 min. 47 3-5 sec.

George Cockburn (Britain), Farman biplane, did not finish.

Sunday was another successful day for Curtiss who won also the Prix de Champagne. The following were the results of this event:—

First prize (£2,000) ....M. Henri Farman
Second prize (£1,000) .M. Hubert Latham
Third prize (£400) ..M. Louis Paulhan
Fourth prize (£200) ..Comte de Lambert
Fifth prize (£200) ....M. Hubert Latham
Sixth prize (£200)..... ..M. Tissandier

There were numerous mishaps on Sunday to mar the pleasure and interest of the flights. Louis Bregnet's machine was completely wrecked, and Blerlot's aeroplane caught fire while he was in the air, the aeronaut being badly burned.

Close view of Blerlot in one of his new monoplanes driven by a 35 H. P. 8 cylinder E. N. B. motor. This view shows the method of mounting the bicycle wheels also the frame work and shows a man in the act of twisting the propeller at the front to start the motor. It also shows clearly the seat arranged for the aviator and the small wheel on a steering column provided with controls for the motor, following automobile practice. The aviator's feet also rest on pedals which assist in the control of the machine

## NEW YORK Y. M. C. A. TO OPEN SCHOOL OF AERONAUTICS

To meet the rapidly growing demand for men trained to build, repair and operate aeroplanes and dirigible balloons and also to prepare others for the sport of flying, the West Side Young Men's Christian Association, 318 West 57th street, on October 13 will open an evening course in aeronautics under the direction of Wilbur R. Kimball, the well known electrical expert and practical aeronaut.

The School of Aeronautics owes its existence to the experimental or test course of lectures given at the West Side Branch last spring by Cortland Field Bishop, President of the Aero Club of America; Augustus Post, Secretary Aero Club; Winthrop E. Scarritt, former President of the Automobile Club of America, and others.

The first course of study is designed to prepare owners and prospective owners for participation in and enjoyment of aerial sport; to train aero chauffeurs and mechanics in the principles of aeroplane management; to teach practical men the principles of construction; to aid civil and mechanical engineers who wish to learn the applications of their science to flight and to prepare writers, newspaper men, advertising men and salesmen to specialize in the new field.

No attempt will be made in the first course of ten evening lectures and demonstrations to give students actual flying practice though this phase of instruction may develop later. There will, however, be ample work in flying models and in constructing miniature planes of various types.

## INCREASE IN PATTERN WORK DUE TO AEROPLANES

In all parts of the world men who are at all of an inventive turn of mind are turning their attention to experimenting with aeroplanes and other devices for flying above the earth, thousands of machines being constructed that never go into the air and many thousands of workmen are kept employed, the effect upon some lines of industry being clearly felt. At a recent meeting of the Pattern Makers' Union of New York, is was announced that mostly all the members were at present employed, many in the manufacture of aeroplanes for experimental purposes.

The American Aviators' Exhibition Company of Chicago, Ill., announces that its first exhibition of flying machines will be held in Chicago, October 9 and will extend through sixteen days. It is said $38,000 in prizes will be awarded. The best woman operator and the youngest operator are to be awarded $1,000 each. Other contests are for speed, appearance, lightness and operation. Glenn H. Curtiss will make five flights.

View of M. Lewis Bleriot arriving at Dover at 5 13 A M Sunday, July 25th, the first man to cross the English Channel in a heavier than air machine, thus winning the "London Daily Mail" prize of $5,000. The wind was blowing at the rate of 20 miles an hour during his flight which lasted 37 minutes and covered a distance of 21 miles A French torpedo boat destroyer attempted to accompany him but was completely distanced by the little monoplane The total span of this machine is only about 24 ft. 6 in. with a sustaining surface of about 150.6 square feet. The motor is a three cylinder Anzani of 22 to 25 H. P., weighing 132 lbs., The propeller which is 6 ft. 7 inches in diameter is made in layers of selected French Walnut, making a propeller which is claimed to be superior to the metal ones on account of absorbing the shocks of the explosive motor and not causing the blades to vibrate. It is claimed that the slip of this propeller is only 15 per cent., which is an exceptional performance in itself. The total weight of the machine including the aviator and fuel for three hours, is about 360 lbs. His arrival was somewhat unexpected as shown by the lack of people to witness this star performance.

Rear view of the Latham monoplane making ready for a start. This picture shows men steadying the machine on its central pair of wheels and shows clearly the position occupied by the aviator and the wheels at his left for controlling the rudders and movable auxiliary planes near the ends of the main wings. It also shows the hinged arm which projects downward about half way between the motor and the wing tip to keep the wing tip from striking the ground.

High winds and minor accidents prevailed on Wednesday and there was only one notable flight. Paulhan, on a heavy Voisin, although hampered by the bad winds, broke Wright's time record by 23 minutes, covering 82 miles in 2 hours and 43 minutes.

On Thursday the honors were taken by Latham, who covered 96 miles beating the distance record made by Paulhan the day

An intensely exciting incident during Aviation Week at Rheims when three heavier than air machines competed for mastery, circling the course in midair at express train speed with as much assurance and certainty as could have been done on "terra firma" with horses or automobiles. The leading machine is Latham's monoplane, followed by Lefebvre in a Wright biplane and Bunau-Varilla in a Voisin biplane.

## AVIATION MEET AT RHEIMS

What was undoubtedly the most successful demonstration of the capabilities of aeroplanes for aerial navigation took place at Rheims, France, from August 22nd to August 29th inclusive.

On the eve of the first day's events a heavy rain storm raised doubts in the minds of the contestants and visitors as to whether the flights on Sunday would take place, but, nevertheless, the following morning about fifty thousand people braved the elements and were present at the aerodrome to see the initial race of that form of craft which promises to play an important part in the future history of at least a goodly portion, if not all, of the world.

By taking advantage of the pauses between the showers several interesting flights were made. Hubert Latham in his Antoinette monoplane completed two circuits of the course at a height of 250 feet in nineteen minutes. His official lap time for the "Tour de Piste" (10 kilometres) was nine minutes and forty-seven seconds. Count de Lambert came next making three laps in twenty-nine minutes, two seconds. Following Lambert came five other aeronauts, Sommer on his Farman, Cockburn, Delagrange, Fournier and Lefebvre, on a Wright, all in quick succession. The Wright machines scored the highest honors on the first day making the best times and distances.

On Monday the weather was fair and the events were exciting. The first flight was that of Paulhan, on his Voisin biplane, who made 35 miles in less than an hour. The lap record made the previous day by Lefebvre on a Wright machine was captured by Bleriot who promptly handed it over to Curtiss.

Tuesday proved to be another inclement day but however there were many graceful and spectacular flights made by Bleriot, Paulhan and Curtiss.

M. Roger-Sommer again made a long-distance flight, staying in the air about an hour and a half. The crowd of spectators, like the day before was too widely scattered and too large for its size to be estimated.

Close view of the Aeroplane sheds at Rheims, showing seven monoplanes being prepared for flight. The one in the foreground is Blerlot's. The entire front of the shed can be removed as shown so that the machines can be taken in or out without turning them around.

# 1910 The MITCHELL

BY VICTOR LOUCHEAD

In the three new Mitchell models for 1910 the Mitchell Motor Car Company's long established ideals of low first and operation costs have been brought to their utmost up-to-date refinement. Without radical changes, numerous small refinements that have gained the stamp of merit in a season's development have been incorporated in the design of the new models. In addition to this, the year's improvement in factory facilities and the enhanced efficiencies of increased quantity production permit a greater value than ever before to reach the user, without reducing the legitimate factory profit.

To day, though there is practically no such thing as an automobile manufacturer wholly independent of the parts specialists, the Racine concern is approaching this ideal so closely as even to have its own department for the manufacture of ball bearings. One tangible result of this condition is the growth of the Mitchell plant, from 25,000 square feet of floor space five years ago to twenty times as much at the present time, with a coincident increase in the working force from 100 to 1800 employees. The cars turned out now number 600 a month or four a year for each employee.

The new models are three in number, the "Model T," a four-cylinder touring car; the "Model R," a four cylinder roadster; and the "Model S," a six-cylinder touring car. All of these represent efforts to cater distinctly to a medium trade, even the six selling for only $2,000. The roadster sells for $1,100 and the touring car for $1,350.

FOUR CYLINDER TOURING CAR.

The Model T chassis has a 112-inch wheel base, with a tread of 56 inches and with the option of 60-inch tread for the roads of the west and south.

The wheels are 34x3½, twelve-spoke front and rear, and are carried on adjustable cup-and-cone ball bearings, made by the Mitchell Company of materials and to

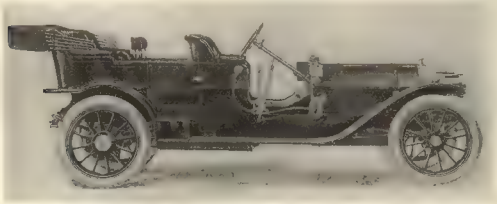


Fig. 1. 1910 Model S Mitchell seven passenger touring car, motor 6 cylinders and 4 inches and rated at 60 H. P. Wheel base 130 inches, tires 36 by 4, rear seats are of platform type, mahogany dash and four piece steel hood held by two straps. This is a big car at $2000

designs from which they have secured the best of results in thousands of cars of past seasons.

THE AXLES.

The front axles are I-beam, forgings without welds, and with steering-pivot ends of the Lemoine type. The lower ends of the steering pivots seat against ball thrust bearings and the upper ends are provided with hollow, spherical, brass oil reservoirs, about one inch in diameter, with ball oiler on top to fill. The steering and drag-link arms are bolted into the pivots, which with the stub axles constitute the usual one-piece L-shaped knuckle. The spring seats are integral with the upper axle flange. Stamped hub caps are used on all wheels.

rear springs are shackled in the usual manclips are used at each axle attachment. Single hexagon nuts locked by spring washers, are used on the clips. Longitudinal displacement of the spring leaves is prevented by stamped lugs and depressions, with large lugs on the bottom leaves fitting in corresponding mortises in the axles. Both front and rear springs are eye-bolted at their front ends to spring horns and standards riveted to the frame sills. The rear ends of the front springs are shackled by up shackles from riveted standards, so that all shocks tend to straighten rather than to tip over the shackles, which cannot reverse because of the normal flatness of the springs. The half elliptics of the

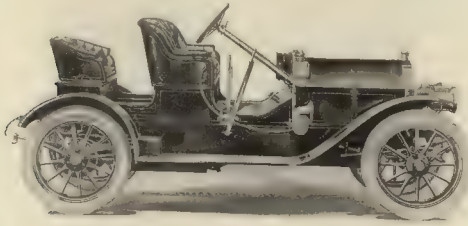


Fig 2 Mitchell Model R Roadster, practically the same chassis as the 4-cylinder touring car but with a 12 inches shorter frame, wheel base 100 inches, surrey seat rumble seat or sloping box rear deck are optional. Roadster equipment, 30 H. P. 4-cylinder motor, $1100.

The rear axle is built up from steel tubing riveted into malleable steel ends and bevel-gear housing, and is strengthened against vertical shocks by the usual adjustable truss rod. The wheels are borne on the axle ends and driven by non-loaded floating members, square-ended into the differential sides and coupled with the wheels by four-toothed, retracted jaw clutches. Unscrewing of the hub caps is all that is necessary to permit withdrawal of the floating axles. The cover of the bevel-gear housing is a steel stamping.

THREE-QUARTER ELLIPTIC REAR SPRINGS.

The springs are half-elliptic in front and three-quarters elliptic in rear, with six 2-inch leaves in front and seven and six 2¼ inch leaves, respectively, in the half and quarter members of the rear springs. The front springs are 41 inches long when straightened out, with the axle attached 3 inches ahead of the center. The main members of the rear springs are 44 inches long, with the axle attached 2 inches back of the centers. Clips riveted by one center rivet to the ends of the fourth leaf down from the top preserve alignment of the leaves in all half-elliptic members. Two

ner to the quarter-elliptics by up shackles. The quarter members are clipped to heavy brackets riveted to the rear frame corners and set out to the sides so that the axle loading is as close as possible to the wheels. A high grade spring steel is used in all leaves and all bearings are arranged for lubrication.

The frame is pressed of heavy gauge steel, with three cross girts riveted in with exceptionally large gussets in all angles to prevent distortion. The side sills are cambered from the dash forward to afford increased steering movement. The motor is carried on a channel-steel subframe. The front cross member is dropped, of channel form, and with the channel up so that the radiator base sets in it.

MOTOR OF THE MODEL T.

The motor is four-cylinder, vertical, 4¼ inches bore by 5 inches stroke, and with the cylinders cast in pairs, with space between each pair between the water jackets and the bases, which for each pair are attached to the crankcase by six bolts. The cylinders are a modified L-shape, with the inlet valves in the L's and the exhausts in cages double bolted into the heads—a

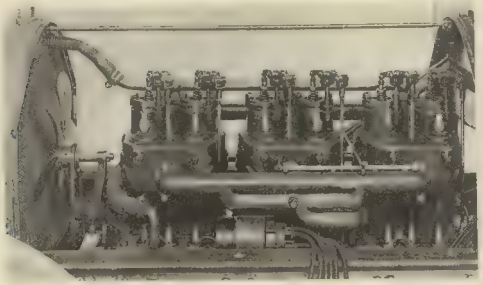


Fig. 3 View of the 1910 30 H P. 6-cylinder Mit-hell motor showing the valve in the head arrangement. the one piece cast inlet manifold, location of spark plugs and the overhead rockers operating the valves.

feature of Mitchell construction that has stood the tests of four successive seasons. All cylinders are offset ¾-inch from the crankshaft center. All the valves are 1½ inch diameter of clear opening, have 45 deg. seats and ¼-inch lift, and are all driven from a single camshaft with integral cams running in two bronze end bearings and a babbited center bearing. The feature of placing the exhaust valves in the head cages—a construction more usual for inlet valves—facilitates grinding and at the same time removes from the material of the cylinders proper the valve seats most subject in all engines to wear and deterioration. New valve cages involving complete renewal of the seat surfaces are purchasable for comparatively trifling sums. The head placing also facilitates very liberal water-jacketing of the exhaust valves as is shown in cuts herewith.

Especial assurance of long maintained compression is provided by four eccentric rings, with stepped opening, at the upper end of each piston. In addition to these, a non-eccentric locking ring is used for piston-pin retention. The tops of the pistons are flat.

The connecting rods are drop-forged steel, I-section, with bronze piston-pin

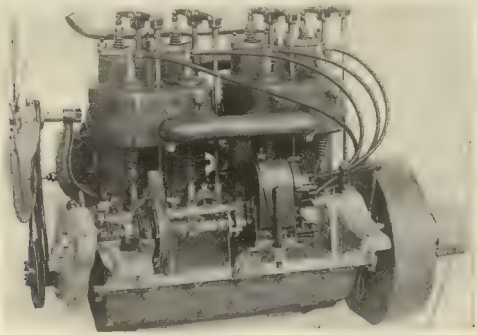


Fig. 4. View of the 4-cylinder 1910 30 H. P. Mitchell motor showing the arrangement and drive of the magneto held by a band and the drive of the fan by round belt and the method of supporting the fan. The twin cylinder castings are the same as used in the 6-cylinder motor.

bearings one inch in diameter by 2⅛ inlong and white metal big-end bearings 1⅝ inch by 2⅛ inches. The piston-pins are hollow.

The crankshaft is three-bearing, each 2 inches in diameter, with the front bearing 3 inches long, the center bearing 2⅞

Common inlet and exhaust chambers with single openings are used for each cylinder pair. The intake manifold is a straight cross tube, with a bent T-connection from the center to the carburetor which is on the opposite side of the engine. The exhaust manifold is similar to the inlet, ex-

Fig. 5. Views of the 4 and 6 cylinder motors installed in their frames showing the arrangement of the oilers, exhaust manifolds and water piping.

inches long and the fly wheel bearing 3½ inches long, affording an unusually high total of bearing area. The flywheel is 16 inches in diameter with 4¼-inch face and is bolted to a flange on the crankshaft.

The valve push rods are of the roller type, with lock and socket nuts adjustable for the inlet valves. The exhaust valves are actuated through overhead rocker arms with adjustable yokes at the push rod ends. A change from the 1909 construction is the provision of rollers in the rocker-arm

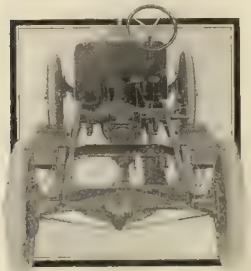


Fig. 6. View of 1910 Mitchell chassis from the rear This shows the arrangement of the rear semi-platform springs and the rear axle combination with a sliding change speed gear at the forward end. This also shows the powerful brakes and the channel section frame construction

ends to make contact with the valve stems. Each pair of push rod guides is held down by a single four-armed yoke, or "crab." The valve stems are slotted for keys which hold the spring retaining washers,

cept that the outlet from it to the muffler is at the rear end and turns down at a righ angle but with a liberal enlargement at the turn.

The crankcase is parted horizontally, with the crankshaft bearings held in the upper half, which is cast of aluminum alloy. The lower portion or pan is of cast iron which Bate considers much superior to aluminum, because it acts as a brace or reinforcing element, preventing the aluminum upper portion from becoming distorted, besides being itself more durable than the more usual aluminum pan. Two hand-holes on the intake side of the engine, covered with screwed-on and gasketed sheet steel plates, permit access to the interior for inspection and adjustment of connecting rod bearings.

The camshaft is driven off the crankshaft by steel helical gears, keyed on their shafts, enclosed in an aluminum housing, instead of by the less quiet spur gears previously used. From the camshaft gear the pump and magneto shaft is driven. The pump is of the centrifugal type, (last year a gear pump was used), with five-bladed impeller and of course with its own bearings, but a long babbit bearing is nevertheless provided between pump and magneto.

Ignition is primarily by a Splitdorf magneto with single non-vibrator coil, which is stock equipment.

The high-tension plugs are in the inlet-valve caps. Provision is made for battery ignition, the current in this case working through the same coil and plugs and being commutated by the magneto.

LUBRICATION AND COOLING

Lubrication is by a mechanical force-feed oiler of individual pump type, driven from the front of the mainshaft. The six leads run one each to the front and rear crankshaft bearings, one to the crankcase,

one to the clutch yoke and one each to the two cylinder pairs. The latter two leads are forked just at their ends, each branching into each cylinder of the pair it feeds.

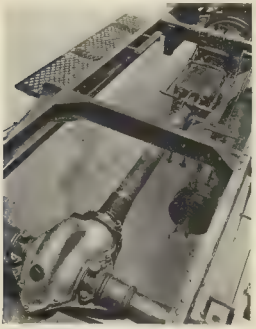


Fig. 7. Closer view of the chassis looking at it from above. Showing the rear axle differential housing, cardon shaft tube housing and at its forward end the sliding change speed gear case. The single tree type brake equalizers are shown just above the muffler

The cooling water enters the jackets under the exhaust outlets, is baffed across to the opposite side, and then leaves the top above where it enters. The radiator is of an improved type, with air draft induced by a large diameter, ball bearing, belt driven, six bladed fan, with stamped steel blades.

The muffler is of the cylindrical, concentric shell type, with heel-pedal cutout regularly fitted. A particularly well-considered feature of the Mitchell muffler is the discharge of the exhaust into the outer shell of the muffler, with the final exit from the center. This results in silencing chiefly by subjecting the exhaust gases to a cooling effect, which contracts them; much sounder engineering than the more usual schemes of muffling by retarding expansion. An ingenious lock scheme is used for the cutout pedal.

The starting crank is of the common four-notched type, engaging with a similarly notched collar on the forward end of the crankshaft. Its radius is 8¼ inches.

The clutch is a leather-faced cone, with springs under the leather to modify the engagement. The female member is turned into the face of the flywheel, while the cone is stamped from sheet steel. The end thrust of the single clutch spring is self-contained, and the actuation of the clutch yoke is direct from a cross rocker, pivoted at its ends in the subframe and cranked over the yoke. In the yoke the bearing surfaces are brass to steel and a felt washer in a groove is used to distribute the oil.

A metal encased universal joint is placed immediately behind the clutch and in conjunction with the trunnion joint in the clutch yoke gives a compensation of the angular velocities, besides allowing for possible frame flexion, the angle of drive being divided. Back of the universal joint is the change gear, housed in a one-piece gear box, closed in front with a cap integral with the rear of the universal joint and closed at the top with a screwed-on and gasketed sheet-steel handhole plate.

NOVEL CHANGE-GEAR MOUNTING.

The mounting of the change gear is quite original being an effort to secure the advantages and escape the disadvantages of the change-gear in rear axle housing scheme, which is so rapidly advancing in popularity. To this end the propeller shaft is housed in a solid and rigid tube, bolted to and practically constituting a long forward extension of the rear axle housing. Then to the forward end of this tube the change-gear is similarly solidly bolted, with the result that change-gear, propeller

Fig. 8. Side view of the chassis of the 1910 4-cylinder Mitchell car showing the location of the control pedals and side levers, the placing of the motor, the rake of the steering post and the pressed steel steps with rolled edges as described in the text.

shaft and rear axle all form a single unit, swinging up and down with the spring movement, but with the first element so far forward—just behind the single universal joint—that its weight cannot add appreciably to the load at the center of the rear axle, or to that carried without spring support on the tires.

Three speeds and reverse are provided, with the layshaft and front end of propeller shaft carried in Hyatt roller bearings.

Fig. 9. Section cut out of one of the twin cylinder castings of the 1910 Mitchell cars showing the coring, thickness of metal and arrangement of the water jackets.

The clutchshaft runs in non-adjustable ball bearings, made in the Mitchell factory, and having the cross section shown in the accompanying sketch. The particular advantage of this type of non-adjustable, annular ball bearing originated by Mr. Bate, is, of course, the ease of assembling, due to the non-grooving of the outer race.

The stock final-drive ratio is 3¼ to 1, with 3¾ to 1 optional, and the bevel gear is held to its work by ball thrust bearings of the type in which the balls are retained in a pair of flat plates of sheet steel crimped together and bear against flat surfaces. The radial load at the small end of the bevel pinion is carried on a non-adjustable, annular ball bearing, with a double-row annular ball bearing behind this gear to take its thrust. The propeller shaft housing serves as a torsion rod, while two tubular-steel distance rods with yokes and pins at both ends and extending from the axle ends to standards on the undersides of the frame sills, in line with the universal joint, serve to maintain rear axle position without interfering with spring action. Hyatt roller bearings are used on the inner ends of the floating axle driving members. The differential is of the bevel type, with the bevel pinions on case-hardened studs.

DOUBLE BRAKE SYSTEM

The brake drums on the rear wheels are 14 inches in diameter, of pressed steel, and braked by both expanding and contracting systems. Shoes and bands are all faced with suitable belting. A detail that is both meritorious and inexpensive is the use of exceedingly light and strong channel section, expanding shoes pressed of sheet metal. The brake bands are spring retracted at several points to prevent dragging.

Steering is made irreversible by a combination of a worm with a complete worm gear instead of a segment. The advantage of this is that the gear can be reset on the squared shaft of the steering gear arm, by turning it half a revolution, with the result that an entirely new wearing surface is presented.

The steering cross connecting rod is ball jointed at both ends, with spring cushions in both ends. The drag link with yoke and pin ends is in front of the axles. The steering wheel is 16 inches in diameter, with wood rim and metal spider.

Control of the ignition and throttle is by twin levers working over separate notched sectors, stationary under the steering wheel and projecting forward. The usual left pedal controls the clutch; the right pedal applies the expanding brake.

NEW TYPE OF ACCELERATOR

The accelerator pedal is a most decided novelty, being a movable metal arc, corrugated on its edge, revolving through a slot in the toeboard, as sketched herewith. The emergency brake lever applies the contracting brake, pulls back to apply and is interconnected to declutch, though the interconnection can be dismounted if it is required to use the engine as a brake, as may become desirable in excessively hilly country. The clutch pedal is mounted directly upon the cross rocker previously referred to, thus attaining an absolute minimum of complication.

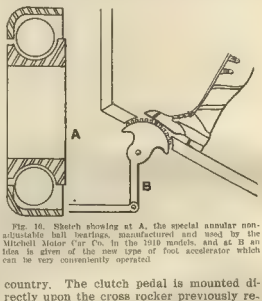



Fig. 10. Sketch showing at A, the special annular non-adjustable ball bearings, manufactured and used by the Mitchell Motor Car Co. in the 1910 models, and at B an idea is given of the new type of foot accelerator which can be very conveniently operated

The change gear lever operates selectively, but rocks instead of passing through an H-slot quadrant. Instead, the H-slot is provided in a small steel plate, standing up from the middle of the middle cross girt

of the frame, above the gear, where it is protected from mud and dirt. This construction is another novelty originated by Mr. Bate. A latch has to be released before entering the reverse.

The dash is mahogany, brass bound, and on its front it carries a very light pressed steel support for the rear end of the four piece steel hood, which is held from rattling by a single strap. The fenders are of sheet steel, ribbed around their margins, and further reinforced by angle steel edgings riveted on their undersides. The running boards are of sheet steel, with staggered stamped projections, and edges rolled into reinforcing tubes. The body, either full tonneau or "close coupled" optional, is of sheet steel and wood over a wood frame, with side doors swinging backward to open. The doors are exceptionally wide.

A sheet-steel pan, held by ingenious and easily and quickly manipulated spring hooks, protects motor and clutch from dust and mud.

MODEL R, THE ROADSTER.

Model R, the roadster, is on a chassis differing from that of the touring car only in minor details. The frame is shorter by twelve inches, the wheel base being 100 inches, and the rear axle is non-floating, with Hyatt roller bearings throughout. The brake drums are 10¾ inches in diameter, and the springs are lighter—having one leaf less all around. Surrey seat, rumble seat, or slopping-box rear deck are optional in the body equipment.

THE NEW SIX.

The Model S, the six-cylinder, has a 130-inch wheel base and is larger and heavier than the other cars, but is nevertheless very similar in many standardized details. The cylinder castings are the same, for one thing, though of course the general construction requires a variety of special features. The crank shaft is four-bearing, the bearings being of the same sizes as in the four-cylinder engines, though two instead of one 2-in. x 2⅞-in. bearings are required in the middle.

The lubricator has two extra leads, one to supply the extra cylinder pair. The frame sills are 4½ inches deep in their middle portion. Metal plates riveted into the middle portions of the side channels, are an extra safeguard against sagging. The rear hubs are larger and the whole rear axle is heavier, but otherwise about the same as that of the Model T.

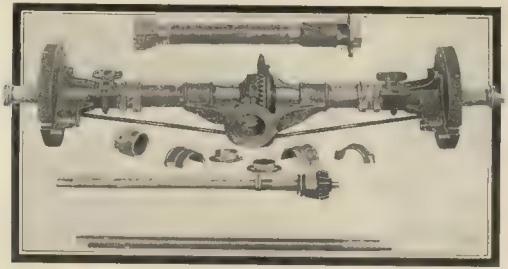


Fig. 11 Rear axle parts of the Model S Mitchell showing the thrust bearings, bevel pinion and shaft, large bevel gear and brake. The axle in Model T is similar in construction but smaller in size.

The change gear differs in that it has a Mitchell annular ball bearing on the forward end of the propeller shaft, where in the small cars a Hyatt is used. Both brakes are compensated by single tree devices. The front wheels run on double annular ball bearings, and the tires are 36x4, all around. The steering wheel is 18 inches in diameter.

The front springs are the same in dimensions and arrangement as those of the four-cylinder touring car, but the rear springs are a triple assemblage of the platform type, with the two half-elliptic side members forty-five inches long and the inverted rear member bolted at its center to a steel bracket at the middle of the rear frame girt, thirty-seven inches long. Ten 2¼-in. leaves are used in each side member and nine leaves in the rear member. To maintain alignment, the side members have clips single riveted on the ends of the fifth leaves down. The axle is attached two inches behind the centers of the side members, and the connection of these with the rear element is by cross shackles.

Two leather straps are used over the hood of this model.

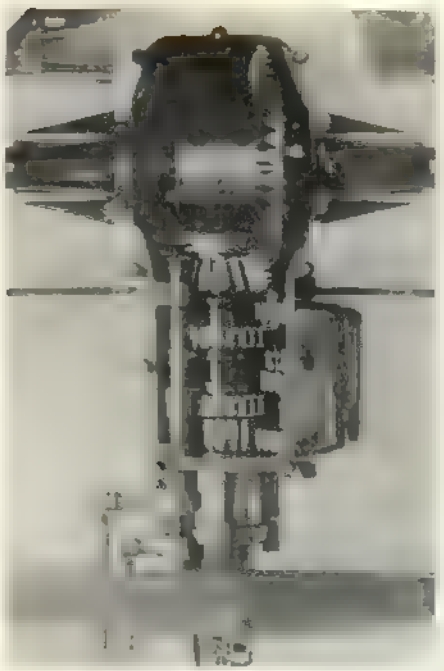


Fig. Matheson 6-cylinder chassis, change-gear and bevel gear with [illegible]. The sliding gear is all 8 d. p. with 8 d. p. tooth lengths. The two sliding gears are chrome nickel steel, all other gears nickel steel, and all the gears are all [illegible] are ½ face. The line shaft is on Hess Bright ball bearings. The side shaft [illegible] ball bearings. The sliding gears are on the squared shaft, 1½ in. diameter, square [illegible] Three [illegible] gear [illegible] lift [illegible] selected.

THE MOTOR

The 6 cylinders are in 3 dual units with integral water-jackets, cylinder bore 4½ ins. x 5 ins. stroke, valves all on top and all on one side, all valves the same, stems and heads steel, stems electrically welded to heads, stems 7-16 dia., heads 2⅜ dia., valves flat faces on flat seats, all ports 2 ins. dia. All valves are in grey-iron cages or sleeves, sleeves seated on shoulders and retained with screw threaded collars. The cylinders are finished by boring and reaming.

THE VALVE ACTION

All the valves are on the right side of the motor-heads, with spring lifts on the valve stems, which are depressed by overhead beams, steel drop forgings, with underside knobs over the valve-stems, at their right ends and underside ball cups at their left ends to take the globe-end long lifter rods, screw adjustment for length at the rod lower ends, over the lifters which rise up through bronze lifter-guides in the motor base. The lifters are forked below the guides and take hard cam-rollers, 1 in. dia. x ⅝ face, on 7-16 pins, rollers riding the cams, which are integral with the cam-shaft.

The grey iron pistons are 5-1000ths. small at top end to below the four snap-ring grooves, then 1-16 small for 2 3-16 ins., then 3-1000ths small for the bottom one inch of length, the piston being 5 ins. long over all.

The piston-pin seats, 1¼ ins. dia., are in the middle of the piston, each pin-hub

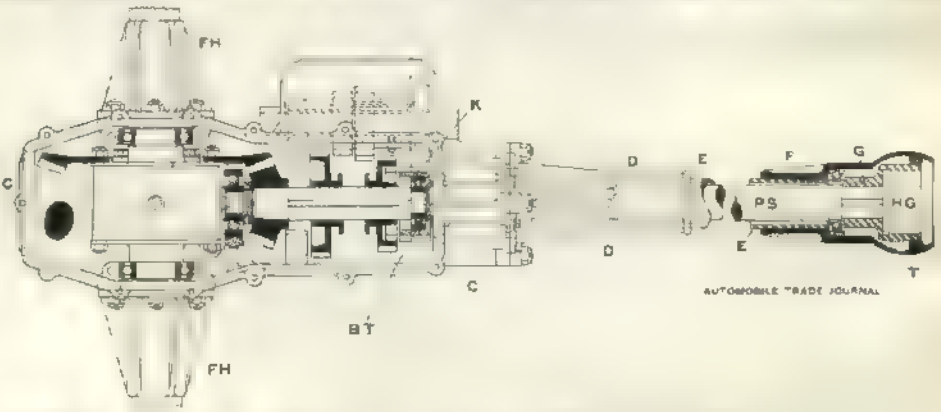



Fig. 6. This shows a very carefully worked out design for a combined bevel gear housing and sliding gear box [illegible] combined with a forward sleeve a tubular steel propeller shaft casing and a jointed [illegible] sleeve, mal[illegible] casing with an exterior gimbed-end and a separate interior hexagon-washer socket to [illegible] gimbal [illegible] ber. The propeller shaft ends are squared, and the bevel pinion shaft, which is the change gear line shaft squared for the sliding gears, has its forward end in a ball bearing seated in a cup and the cup shank is in two ball bearings and has its forward end squared to connect by a square-eyed sleeve [illegible] with the squared rear end of the propeller shaft, the propeller shaft forward end squared, slips in to the [illegible] of the washer socket [illegible]. The objects of this construction are to obtain a lathe-work alignment and permit easy construction and ready assembling and disassembling. BT Single [illegible] bevel pinion shaft forward end at [illegible] [illegible] for a single ball ⅝ in. diameter, axially seated, which [illegible] the bevel pinion thrust to the [illegible]-inch thrust bearing." This single ball thrust has been used for years and works well. C C. C. C. C. malleable casting bevel gear housing and change-gear box bored at forward end to take the rearward sleeve end of D.

D. malleable casting sleeve flanged to bolt on C, with a sleeve extension into C to take the ball bearings 208. D takes the rear end of the tubular propeller shaft sleeve. E F.

E. E. Tubular propeller shaft sleeve, ends forced into D and F., and retained with ⅜ taper screws, tapped through both thicknesses.

F. F. Malleable casting gimbel shaft end, [illegible] hexagon socket G, with a hexagon seat F. G. 302. Bevel gear [illegible] 403. Inside pinion shaft-bearing. 405. Forward pinion shaft-bearing, seated in pinion [illegible] 208. 208. [illegible] for the stem of the cupped gear, K, and for the forward end of the propeller shaft. PS. PS. Propeller shaft, squared at both ends.

Fig. 5. Mc Intosh 6-cylinder motor in position in chassis, right side, showing the aluminum carburetor pipe constructed. The two crank box ventilators have hinged tops with [illegible] by [illegible] wing nuts. This illustration shows the valve-lifting springs [illegible]

dinary spring clips, each with two nuts, ½ in. dia. thread.

The front springs are 34 ins. long x 2 ins. wide, 7-leaves, lipped, top 3 leaves banded together, springs perched in the middle, jointed to the side-frame eyes in front and linked to the chassis frame sides in the rear

All spring-eyes are steel-bushed with ½ bush-holes in front and ⅝ in rear, bolts drilled with central and cross oil-holes and outside ends of oil-holes tapped for removable oil-screws to permit hand-oiling.

The rear spring lower member is 40 ins. spring-eye to spring-eye x 2 ins. wide 8 leaves, lipped, perched in the middle on revoluble rear axle perches, top of perch shaped to fit the spring, cast malleable iron perch with heavy-grease screw-cap cup. The top member of the rear spring, ¼ elliptic, has a scroll head, linked to the lower member end, is 21½ ins. horizontal distance from spring-eye to forward end, 8 leaves, lipped, bottom member has 3 leaves banded together, top member has two bands, top end fixed to malleable-casting chassis-frame brackets by center bolt head and two spring clips with two ½ nuts and screws each. Diagonal chassis frame braces go from each top spring

Fig. [illegible] McIntosh 6-cylinder motor in [illegible] left side showing fan and magneto and water pump [illegible] the valve-stem lifters and beam push-rods. H. P. is the hold-[illegible] which [illegible] pushed forward to release the pawl and permit it to be spring-engaged with the [illegible] ratchet.

the spoke flanges are 7½ ins. dia., 10 spokes, with 5 flange bolts, each 7-16 dia. The Timken bearings give the possibility of adjustment for wear, and also give line-bearings instead of the point-support inseparable from the ball-bearing.

annular bearings, one bearing between the bevel pinion and balance gear casing. The bevel pinion and gear, nickel steel, oil tempered, are 4 d. p. pinion 16 teeth, gear 44 teeth, 1½ ins. face. The balance gear is bevel, nickel steel, 6 d. p., 1 in. face, 4

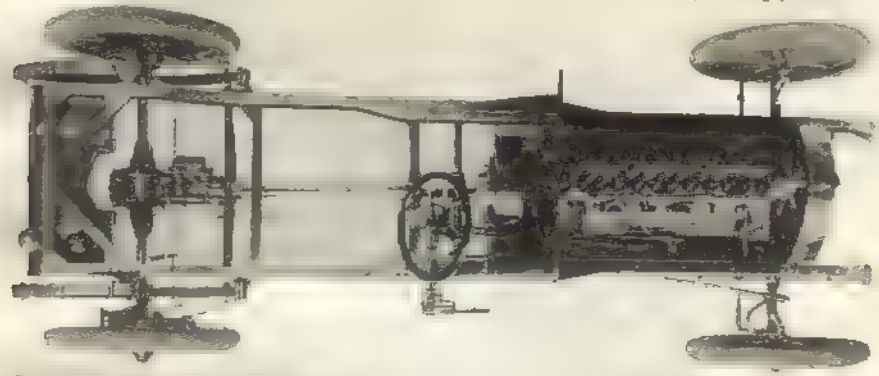


Fig. 2 Matheson 6-cylinder chassis plan. The gasoline tank is oval in section and is carried [illegible] the rear [illegible] tank [illegible] straps [illegible] passed around [illegible] and fixed to the chassis frame near [illegible] to the straps in front of the diagonal frame members, to which each bracket is fixed by a ⅝ bolt. The gasoline tank has about 2 pounds pressure from the exhaust through a check-valve to a reducing valve [illegible] with [illegible] pressure gauge and a hand air pump on the front board. Pump not shown in these illustrations. Fig. 3 also shows the full length fouled steel brake-eveners, carried in chassis frame side slots

The axle fork opening is about 5½ ins., the top pin-eye hub is 1 5-16 deep and the bottom one is 1⅛ deep. The stub-axle pin is hardened and ground, 13-16 dia., in hardened and ground steel bushings, flanged at top end in both yoke end and stub-axle eye, to carry the load.

A heavy-grease cup is screwed into the top end of the pin, which has a central grease hole with cross-holes to the load-carrying, hardened-steel-bush flanges. See Fig 5

THE REAR AXLE AND WHEELS.

The rear axle is a Matheson construction throughout. The rear tires are 36x4 ins. The rear wheels have 12 spokes, 1¾ thick. The spoke flange is 7 ins. dia., with 6 flange bolts ⅜ dia.; the pressed-steel brake-drums are 14 ins. dia., and take 12 spoke bolts, ⅜ dia., bolt circle 12 ins. dia.

The axle sleeves, steel tube, are 2½ ins. out. dia., ¼ in. wall, reduced to a taper, 2 ins. large end dia. and 1⅝ ins. small end dia. 2 13-16 long, between two Hess-Bright annular bearings Nos. 209 and 210, 3⅝ center to center.

The floating live axles, nickel steel, are 1¼ dia., squared at both ends, and the whole live axle is oil tempered. The drive from the live axle to the wheel hub is a 6-tooth clutch slipped on the axle square; the clutch teeth are ¾ in. wide x ½ in thick. The clutch is nickel-steel, the wheel hub is malleable casting.

The bevel gear housing is a crucible-steel casting, integral with the sliding gear box, and is capped 3 ins. above the axle center, cover retained with 14 studs ⅝ dia. and four bolts, ⅝ dia. Removing the cover gives access to the change-gear and bevel-gear. The line-shaft is all on Hess-Bright

pinions, each 14 teeth, gears 24 teeth, all oil tempered. The flanged, cast malleable, housing hubs are forced on the steel tube axle sleeves and retained with 8 tapered screws, ⅝ large dia., tapped in both the hub and sleeve, and turned down hard on the thread, no shoulder. The balance gear hubs are on Hess-Bright annular bearings, No. 309. The bevel gear thrust is taken by a standard thrust bearing, balls ¼ dia.

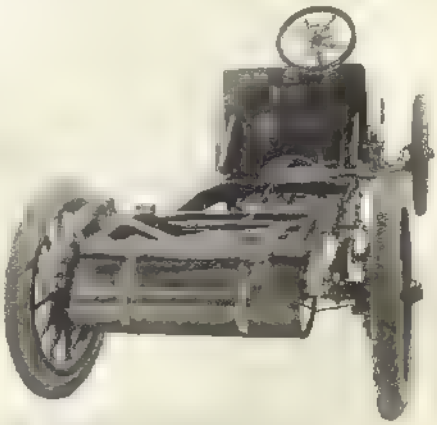


Fig. 4 Matheson 6-cylinder chassis, rear view, showing gasoline tank and rear support and rear springs construction. The gasoline tank-filling nozzle, screw capped of very large diameter, is shown at the right.

THE SPRINGS.

These are half-elliptic in front and three-quarter-elliptic in rear. The front springs are retained on a steel casting bolster with bottom flanges, top shaped to spring curve, canvas and white lead packing between bolster and spring, by the middle spring bolt head and by two or-

¼ dia. in each segment, worked without lubrication.

The hold-back ratches, see Fig. 14, are steel drop forgings, 7½ out. dia. x ⅝ face, 24 teeth and are fixed to the brake-drum insides by the wheel-hub spoke-flange six bolts, ⅝ dia. The hold-back pawl, steel drop-forging, normally spring engaged with the ratchet, is locked out of engagement by a toe-board pedal, and the pedal must be unlocked before the pawl-spring can effect the pawl-and-ratchet engagement.

CONTROL.

The steering action is a hardened steel worm engaging a hardened steel worm gear sector.

The spark and throttle levers are ratchet retained on top of the hand-wheel. The outside hand lever, latched, is pulled backward to apply the emergency interior-brake-shoes. The inside hand lever has four working positions and one neutral position in a 2-slot quadrant, and effects the selective changes of the three forward speeds and a reverse sliding gear.

The left hand large pedal is pushed forward to disengage the multiple disc clutch. The right hand large pedal is pushed forward to apply the exterior ordinary brakes. A small plunger pedal at the right opens the throttle when depressed. A small latched pedal, directly in front of the accelerator pedal, is pushed forward with the foot to unlatch it and permit the hold-back pawl-spring to engage the hold-back-pawl and ratchet, and the latched pedal is depressed and moved backward with the foot to lock the ratchet pawl out of ratchet engagement. The muffler cut-out pedal is not shown in these illustrations. There is no interlinking of any of the control actions.

ON THE ROAD

The weather and road conditions at Wilkes-Barre, Pa., Wednesday, February 3, 1909, were such as to make a run of any length on the Matheson six impracticable, the roads being obstructed by snow drifts. A short run on a Matheson six chassis, tester's seats only, was made in a snow storm, John M. Deatrich, driver, Hugh Dolnar, front-seat observer, from the Matheson factory, through Luzerne and Trucksville to Dallas and return, 16 miles round trip. There is plenty of long hill climbing in this route, but hardly a half-mile of straightaway, the narrow road thronged with heavy teams drawing logs of timber, winding among the hills in a way to forbid anything like pace.

The Matheson six showed its power by taking everything on high gear, in spite of the newly fallen snow, and was very handy in meeting and passing heavy horse traffic on the narrow and crooked pike. Our high speed was 55 miles only, and this short 16 mile run was quite long enough for comfort, with snow cutting the faces of the driver and the observer sharply and icicles hanging from eyebrow and mustache.

The Matheson six is quiet, very easy riding indeed and has ample power for 65 or 70 miles straightaway, and gives the substantial feeling and smooth propulsion which characterize the thoroughly well built chassis, driven by a responsive six cylinder motor.

## MAXWELL-BRISCOE CO. ENLARGES TARRYTOWN FACILITIES

Maxwell-Briscoe Motor Co. has leased the Ingersoll-Rand Drill Works, at Tarrytown, N. Y., to be used as an auxiliary to their Tarrytown factory. The 1909 output of Maxwell cars will be approximately 12,000, but for 1910 about 20,000 will be produced. The Maxwell-Briscoe Co. have been employing 1,000 men at the Tarrytown factory, but the taking on of the additional factory building will enable them to largely increase their force and the move is therefore welcome news to Tarrytown.

## NEW RUBBER MOULDING PROCESS

Patent No. 910,307, issued January 19, 1909, to Frederick J. Gleason, of Walpole, Mass., president and general manager of the Massachusetts Chemical Co., covers a process of forming rubber goods over a mandrel or core which will undoubtedly have a marked influence on the motor car trade as affecting the manufacture of tires and other rubber articles used in this trade.

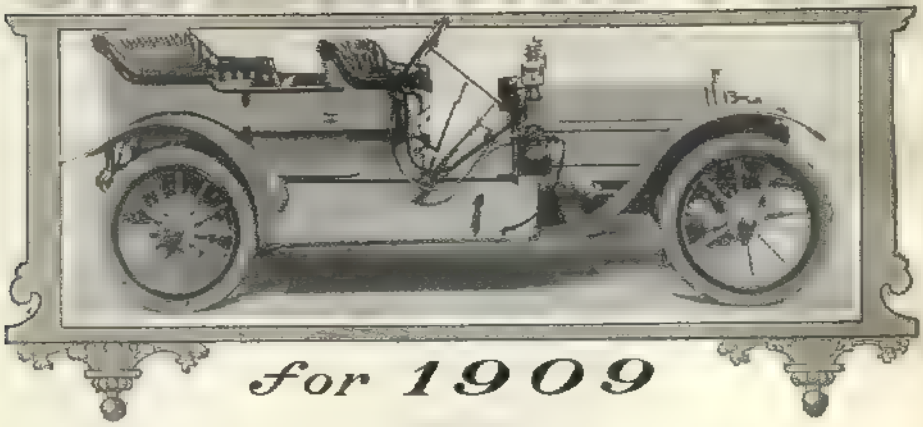
The chief feature of the Walpole process is the use of fusible cores that fuse at the temperature required for vulcanizing the rubber. The core may be made of fusible metal fusing at the desired temperature, but the patent includes any suitable fusible material. Heat applied to the exterior of the mould will cure the rubber from the exterior to the interior and melt the core while vulcanization is being effected.

It is then a simple matter to remove the core in liquid form through the neck of the bottle in the instance of the rubber bottle or through the valve in the instance of the tire, etc.

Royal Equipment Co., of Bridgeport, Conn., now have in their factory a specially designed machine for testing the coefficient of friction of brake lining materials. As manufacturers of Raybestos brake lining they are desirous of keeping informed of the qualities of all brake lining materials and this machine was designed for this purpose.

Automobile licenses in New Jersey are now transferable from one car to another according to a recent ruling of the State Commissioner of Motor Vehicles. The fee for effecting the transfer is $1

# The Matheson Cars



## for 1909

HUGH DOLNAR

Fig 1 Matheson 1 [illegible] 6-cylinder touring car 5 passengers Wheel base, 125½ [illegible] Tires are 36x4 inches. Motor, 6 cycle., 4½x5 inches. 4-cycle water cooled 50 H P [illegible] disappearing [illegible] with 3 forward speeds and reverse sliding selective gears, in integral gear box at [illegible] gear [illegible] weight about 2[illegible] pounds price $3000, including 5 lamps, gas tank, tire carriers mats, horn and tools [illegible] top $[illegible] extra.

Matheson Automobile Company, 1886 1888 Broadway, New York City, U. S. A., factory at Wilkes-Barre, Pa., will offer for the season of 1909 a 6-cylinder, 50 H. P. 5-passenger car, an all new Matheson design, embodying many features of much interest, price $3,000, and will continue the well known Matheson 4-cylinder, 7-passenger touring car, 50 H. P., price $4.500.

The following detailed description refers to the Matheson new six-cylinder touring car only, the highly successful Matheson 1908 4-cylinder, 7-passenger car construction being too well known to need repetition here.

### NOTABLE FEATURES

This Matheson new six-cylinder motor has a beam valve motion, valves all in the cylinder heads, with jump-spark and high-tension Bosch magneto. The valve-action, the oiling-system and the fan-drive and support show interesting novelties in construction, and the whole underside of the motor and fly wheel are protected from road drift by the motor-base side extensions and the combined oil-basin and fly wheel shield, which are substantial aluminum castings

The sliding gear box and the bevel-gear housing are in one integral crucible-steel casting, and there is nothing between the motor and the rear axle assembly save the propeller shaft casing, globed at its forward end and performing the functions of struts and torsion arm.

### THE FRONT AXLE AND WHEELS

The front axle is by Timken, I-section, steel drop-forging, no weld, greatest depth 2⅛ ins. x 1 11-16 ins. width, web and ribs about 5-16. The stub-axle greatest diameter is 1½ ins. The front tires are 36x4 ins., the spoke thickness is 1⅜ ins. and

Fig 2. Matheson 6-cylinder chassis right side. The chassis frame sides are raised in [illegible] rear 4½ inches The [illegible] board and front board are both supported by pressed steel brackets, flanged in front [illegible] the [illegible] and on the inclined top surface, and fixed to the tops of the side frames with two ⅜ bolts in each [illegible].

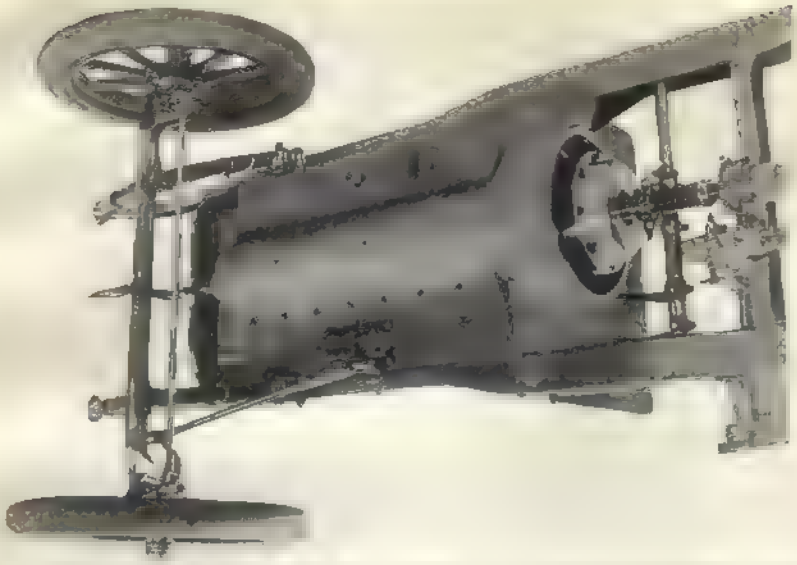


Fig. 7. Matheson [illegible] chassis, [illegible] to [illegible] the [illegible] frame [illegible] the [illegible] chassis frame with [illegible] base under side. When the integral oil basin and flywheel shield is removed the [illegible] This picture also shows the clutch-casing and the clutch rocker [illegible]

north to the middle of the rear chassis frame member.

THE CHASSIS FRAME.

This is pressed steel, channel section, 5/32 thick 1½ ins. greatest depth, 2 ins rear end 37½ ins. This chassis frame has four cross-girts, and four diagonal braces, two in the rear as shown in Figs 4 and 11, and two, not shown in these pictures, from the second cross-girt, 15

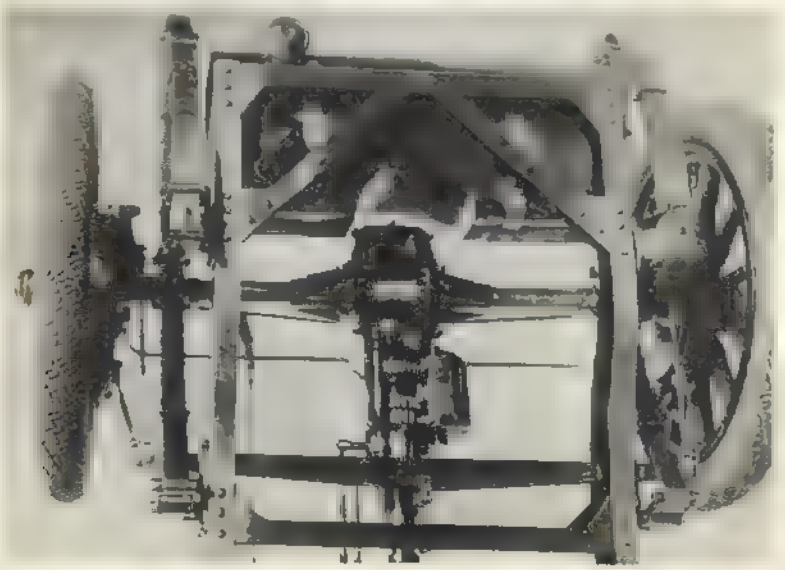


Fig. 8 Matheson 6-cylinder chassis, plan [illegible] showing [illegible] housing construction and brake and spring construction

least frame side width, 4 ins greatest side-frame width to reinforce frame-side bends.

The chassis frame is in two widths, 30 ins wide in front and 34 ins wide in rear. The side frame bend is 14¼ ins long, OG form. Front spring eye to chassis frame

deg. angle to the chassis frame-sides in rear of cross girt. The chassis frame is hot riveted throughout. The front cross-member is dropped 4¾ ins. The illustrations shows the gussets, rivets and brackets in sufficient detail.

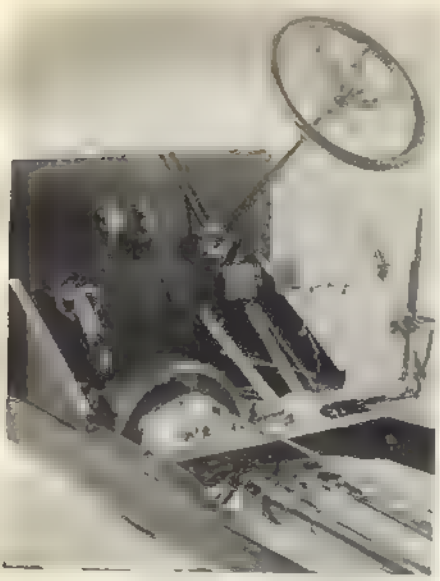


Fig. Matheson 6 cylinder chassis control. See sub-head A.P., accelerator pedal.

tapped for a 5-16 dia. tit-set-screw, screwed down hard on the head, no split-pin retention. The piston pins are hardened and ground steel, 1¼ ins. dia. with a ⅝ hole clear through.

The cylinders are offset ¾ of an in., stroke 5 ins. The rods are 40 carbon steel drop forgings, top eyes bronze-bushed with large oiling cuts on top. The lower ends are marine type, with phosphor-bronze half-boxes, semi-cylindrical, doweled. Caps held with 2 bolts, each 7-16 dia. with castellated nuts and split-pins. The rods are 10 ins. C to C. The rod-body sections are, top end width 1⅛, thickness ¾, web and ribs about 3-16 all through, fillet radius 5-16; bottom end width 1⅜, thickness ⅞.

The crank-shaft, wrists and journals all 1¾ ins. dia., 40 carbon steel, drop forged in 3 groups of two wrists each, groups 120 deg. apart. Two discs, 7½ ins. dia. are placed between the end wrists to facilitate the partial-die drop-forging discs concentric with journals. The wrists and journals are finished by grinding.

The crank shaft is on four journals, front end in an annular ball-bearing, Hess-Bright No. 410, and the three other bearings are in phosphor bronze half-bearings, semi cylindrical and flanged and doweled. The firing order of the cylinders is 1, 4, 2, 6, 3, 5. The motor-base and oil-basin are aluminum

The carburetor is Matheson design and construction, multiple stand-pipe, not yet ready for detailed description

MOTOR LUBRICATION

The motor lubrication is by splash, the oil-basin being divided into 6 crank-pits by lune-shaped ribs, only 1 inch high at the middle. Each crank-pit has a drainage screw-plug in the bottom. The cylinders have oil-grooves 2½ ins. above the low piston travel.

The oil-forcing system is a Lavigne mechanical oiler, 3-leads, placed in an oil-basin compartment of its own, with one lead to a horizontal oil-pipe having branches to the six-cylinder oil-grooves, a second lead to a second oil-pipe with six drip pipes to drip on the lower ends of the connecting rods as they move, and a third lead to a third oil-pipe with leads to the crank-shaft three plain bearings. Whatever drip there is goes to supply the 1-in. deep individual crank-pits. There is no return of oil from the crank-pits to the mechanical-oiler reservoir.

The ignition is by high tension magneto and jump-spark plugs.

UNDERNEATH PROTECTION

The motor-base covers the whole underside of the chassis frame back to the fly wheel, and hangs on 6 lugs on top of the frame sides, 3 lugs on each side, ⅝ bolts through the frame sides and lugs, horizontally. The oil-basin and the fly wheel underneath-shield are integral, so that they may be removed together.

THE WATER CIRCULATION

This is by a centrifugal pump, aluminum casing, bronze impeller and steel shaft and bronze stuffing-box caps. The shaft is gear driven from the cam-shaft, 1½ turns to one turn of the crank-shaft. The oiler, pump and magneto are on the left side of

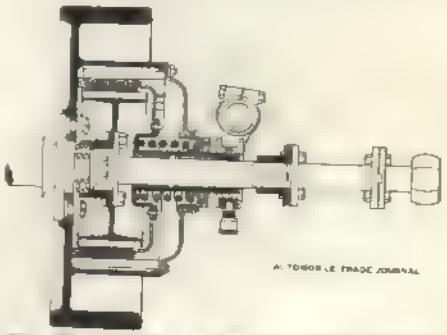


Fig. Matheson multiple disk clutch. Sectional view showing [illegible] bolts to [illegible] in each flange to permit [illegible] without end motion, lg side motion only [illegible] Flywheel and [illegible] clutch construction specified [illegible].

he motor, oiler in front, pump in the middle and magneto in the rear, pump shaft clutched to the oiler shaft in front and to the magneto shaft in the rear, both the clutches being two-jawed so as to slip apart sidewise, for ready assembling and disassembling, the oiler, pump and magneto all being driven at the same speed, 1½ turns to one turn of the crank-shaft.

THE FAN.

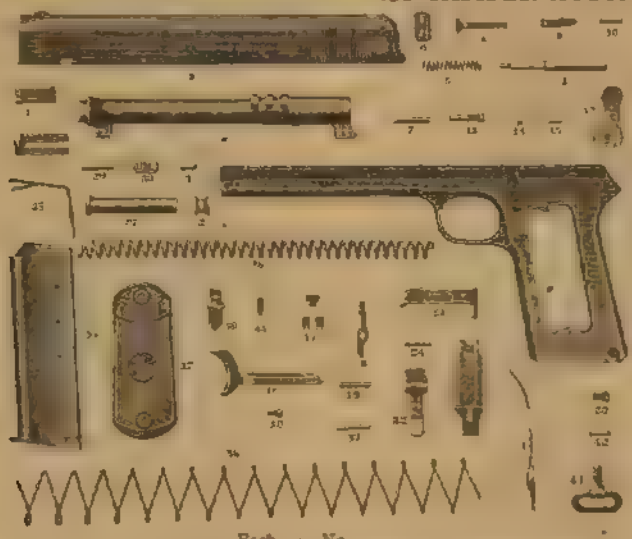
The fan frame is a vertical aluminum casting sleeve, flanged near the bottom end and capped on top. The vertical fan-shaft is bevel-gear driven directly from the crank-shaft, 2 to 1 and the horizontal fan-shaft is miter-gear driven from

# Component Parts of Colt Pistols

## .45 CALIBER AUTOMATIC—Continued

| No. | Each |
|---|---|
| 25–Ejector Pin | $ 0.02 |
| 26–Retractor Spring | .15 |
| 27–Follower | .25 |
| 28–Plug (Take Down) | .25 |
| 29–Plug and Link Pin (2) | .02 |
| 30–Link (2) | .10 |
| 31–Link Pin, Short (2) | .01 |
| 32–Magazine Catch | .25 |
| 33–Magazine Catch Pin | $ 0.02 |
| 34–Magazine Follower | .05 |
| 35–Magazine Spring | .40 |
| 37–Stock, Right and Left Hand (per pair) | 1.50 |
| 38–Stock Screws (4) | .02 |
| 38–Stock Screws (4) | .02 |
| Stock Screw Studs (4) | .05 |

## .38 CALIBER AUTOMATIC



| No. | Each |
|---|---|
| 1–Receiver | $12 00 |
| 2–Barrel | 3 00 |
| 3–Slide | 3.50 |
| 4–Firing Pin | .15 |
| 5–Firing Pin Spring | .02 |
| 6–Rear Sight | .25 |
| 7–Firing Pin Lock Pin | .02 |
| 8–Shell Extractor | .20 |
| 9–Shell Extractor Spring | .05 |
| 10–Shell Extractor Pin | .02 |
| 11–Slide Lock | .20 |
| 12–Hammer | .45 |
| 13–Hammer Screw | .03 |
| 14–Hammer Roll | .03 |
| 15–Hammer Roll Pin | .02 |
| 16–Trigger | .90 |
| 17–Sear | .45 |
| 18–Safety | .35 |
| 19–Sear and Safety Pin | $ 0.02 |
| 20–Sear, Safety and Trigger Spring | .25 |
| 21–Main Spring | .25 |
| 22–Main Spring Screw | .03 |
| 23–Ejector | .40 |
| 24–Ejector Pin | .02 |
| 25–Recoil Plug | .15 |
| 26–Retractor Spring | .15 |
| 27–Follower | .25 |
| 28–Plug (Take Down) | .25 |
| 29–Plug and Link Pin | .02 |
| 30–Links (2) each | .10 |
| 31–Link Pin, short | .01 |
| 32–Magazine Catch | .25 |
| 33–Magazine Catch Pin | .02 |
| 35–Magazine Follower | .05 |
| 36–Magazine Spring | .35 |
| 37–Stocks, per pair | .75 |
| 38–Stock, Screws (4) each | .02 |
| 39–Slide Stop | .75 |
| 40–Slide Stop Spring | .10 |
| 41–Swivel | .15 |
| 42–Swivel Pin | .03 |
| Extension Screws, per set of 4 | .10 |
| Front Sight | .15 |
| Firing Pin Lock Stop | .05 |
| Firing Pin Lock Stop Spring | .02 |

## .32 AND .380 CALIBER AUTOMATIC

| No. | Each |
|---|---|
| 1–Receiver, Cal., .32 | $ 8 50 |
| Receiver, Cal., .380 | 10.00 |
| 2–Barrel | 2.00 |
| 3–Slide | 3.00 |
| 4–Front Firing Pin | .12 |
| 4a–Rear Firing Pin | .10 |
| 5–Firing Pin Spring | .02 |
| 6–Rear Sight | .20 |
| 7–Firing Pin Lock Pin | .02 |
| 8–Shell Extractor | .20 |
| 9–Shell Extractor Spring | .03 |
| 10–Shell Extractor Pin | .02 |
| 11–Barrel Lock | .50 |
| 12–Hammer | .35 |
| 13–Slide Lock Safety | .40 |
| 14–Hammer Roll | .03 |
| 15–Hammer Roll Pin | .02 |

Continued on next Page

When ordering Colt Parts, give Number of Part, Model and Caliber of Arm.

# Component Parts of Colt Pistols and Revolvers

## .32 and .380 CALIBERS AUTOMATIC—Continued

| No. | Each |
|---|---|
| 16–Trigger | $ 0 75 |
| 17–Sear | 35 |
| 18–Safety | 10 |
| 19–Sear and Safety Pin | .02 |
| 20–Sear, Safety and Trigger Spring | .15 |
| 21–Main Spring | 10 |
| 22–Plug | .12 |
| 23–Plug Pin | 02 |
| 24–Ejector | 50 |
| 25–Ejector Pin | $ 0 02 |
| 26–Retractor Spring | .10 |
| 27–Retractor Spring Guide | .15 |
| 28–Automatic Grip Safety | .75 |
| 29–Automatic Safety Pin | 02 |
| 30–Magazine Catch | .25 |
| 32–Magazine Follower | $ 0 05 |
| 33–Mag. Spring, Cal .32 | 20 |
| Mag. Spring, Cal .380 | 30 |
| 34–Stocks, per Pair | .75 |
| 35–Stock Screw | 02 |
| Escutcheons, per Set | .05 |
| Slide Lock Safety Screw | 05 |
| Front Sight | 10 |

## "NEW SERVICE" AND "NEW SERVICE TARGET"*

| No. | Each |
|---|---|
| 1–Hammer | $ 1 50 |
| 2–Strut | .25 |
| 3–Strut Spring | 06 |
| 4–Strut Pin | .03 |
| 5–Hammer Stirrup | .20 |
| 6–Hammer Stirrup Pin | 03 |
| 7–Hammer Pin | .05 |
| 8–Crane | $ 3 00 |
| 9–Crane Bushing | .10 |
| 10–Crane Lock | .25 |
| 11–Crane Lock Screw | .07 |
| 12–Latch | 1.00 |
| 13–Latch Spring | 02 |
| 14–Latch Pin | .15 |
| 15–Trigger | $ 0 75 |
| 16–Trigger Pin | 04 |
| 17–Rebound Lever | 85 |
| 18–Rebound Lever Fly | .10 |
| 19–Rebound Lever Pin | .04 |
| 20–Ejector and Ratchet | 85 |
| 21–Ejector Rod | 45 |
| 22–Ejector Rod Head | 15 |
| 23–Ejector Spring | .10 |
| 24–Main Spring | 70 |
| 25–Bolt and Spring | 35 |
| Bolt Spring | 05 |
| 26–Bolt Screw | 05 |
| 27–Swivel, Complete | .19 |
| 28–Swivel Pin | .03 |
| 29–Hand | .50 |
| 30–Stock Screw | .05 |
| 31–Stock Pin | 03 |
| 32–Side Plate Screw | 05 |
| Barrel | 3 00 |
| Cylinder | 3.50 |
| Lock Frame | 7.50 |
| Stocks, per Pair | 75 |
| Escutcheons, per Set | 00 |
| Recoil Plate | .05 |
| Side Plate | 1 35 |
| Swivel Nose Firing Pin | .15 |

*Extra price charged for Target Revolver Parts. In ordering parts, specify Number of Revolver

## "NEW ARMY," "NEW NAVY," MARINE CORPS AND OFFICERS MODEL*

### Old Style Revolvers

| No. | Each |
|---|---|
| 1–Hammer | $ 1.50 |
| 2–Trigger | .60 |
| 3–Trigger Pin | 03 |
| 4–Crane | 2 50 |
| 5–Latch | .75 |
| 6–Latch Spring | 02 |
| 7–Latch Pin | 02 |
| 8–Rebound Lever | .45 |
| 9–Hand and Hand Spring | .35 |
| Hand Spring | 05 |
| 10–Strut | .25 |
| 11–Strut Spring | .06 |
| 12–Strut Pin | .03 |
| 13–Hammer Stirrup | .20 |
| 14–Hammer Stirrup Pin | .02 |

Continued on Next Page

When ordering Colt Parts, give Number of Part, Model and Caliber of Arm.

# Component Parts of Colt Revolvers

## "NEW ARMY," "NEW NAVY," "MARINE CORPS," AND OFFICERS MODEL*

### Old Style Revolvers—Continued

| No. | Each |
|---|---|
| 15–Hammer Pin | $ 0.03 |
| 16–Crane Lock | .15 |
| 17–Crane Lock Screw | .07 |
| 18–Crane Bushing | .05 |
| 19–Bolt and Bolt Spring | .25 |
| Bolt Spring | .05 |
| 20–Locking Lever | .10 |
| 21–Lock Lever Screw | .05 |
| 22–Ejector and Ratchet | .75 |
| 23–Ejector Rod | .30 |
| 24–Ejector Head | .15 |
| 25–Ejector Spring | $ 0.10 |
| 26–Rebound Spring | .35 |
| 27–Rebound Spring Pin | .03 |
| 28–Main Spring | .55 |
| 29–Main Spring Set Screw | .05 |
| 30–Stock Screw | .05 |
| 31–Side Plate Screw | .05 |
| 32–Trigger, '89 Model | .60 |
| 33–Hand and Hand Spring, '89 Model | .35 |
| Barrel | 2.00 |
| Cylinder | $ 3.25 |
| Swivel Ring | .05 |
| Swivel Stud | .10 |
| Swivel Complete | .19 |
| Lock Frame | 7.00 |
| Stocks, per pair | .75 |
| Stocks for Marine Corps, per Pair | 2.35 |
| Escutcheons, per set | .05 |
| Recoil Plate | .05 |
| Side Plate | 1.00 |

*Extra Price charged for Officers' Model Parts.

The above Parts are suitable for all New Navy and New Army Revolvers made excepting Nos. 32 and 33 which are adapted to the first Model New Navy, made without Cylinder Bolt or Automatic Safety Device. In ordering, give Number of Part.

## "ARMY SPECIAL" AND "OFFICERS MODEL"*

### New Style Revolvers

| No. | Each |
|---|---|
| 1–Hammer | $ 1.50 |
| 2–Hammer Pin | .05 |
| 3–Hammer Stirrup | .20 |
| 4–Hammer Stirrup Pin | .03 |
| 5–Safety | .25 |
| 6–Safety Lever | .10 |
| 7–Strut | $ 0.25 |
| 8–Strut Spring | .06 |
| 9–Strut Pin | .03 |
| 10–Firing Pin | .15 |
| 11–Firing Pin Rivet | .02 |
| 12–Hand | .50 |
| 13–Main Spring | .60 |
| 14–Crane | 2.50 |
| 15–Crane Bushing | .10 |
| 16–Crane Lock | .25 |
| 17–Crane Lock Screw | .07 |
| 18–Latch | .80 |
| 19–Latch Spring | .02 |
| 20–Latch Pin | .15 |
| 21–Trigger | .75 |
| 22–Trigger Pin | .04 |
| 23–Ejector and Ratchet | .80 |
| 24–Ejector Rod | .35 |
| 25–Ejector Rod Head | .15 |
| 26–Ejector Spring | .10 |
| 27–Bolt | .50 |
| 28–Bolt Spring | .05 |
| 29–Bolt Screw | .05 |
| 30–Rebound Lever | .80 |
| 31–Rebound Lever Pin | .04 |
| 32–Stock Pin | .03 |
| 33–Stock Screw | .05 |
| 34–Side Plate Screw | .05 |
| Frame and Side Plate | $ 8.00 |
| Side Plate | 1.00 |
| Cylinder | 3.50 |
| Barrel | 2.50 |
| Stock | .75 |
| Escutcheons, per set | .05 |
| Recoil Plate | .05 |

Extra Price Charged for Officers' Model Parts.

## "POCKET POSITIVE," "POLICE POSITIVE" AND "POLICE POSITIVE TARGET"* REVOLVERS

### CALIBER .32

| No. | Each |
|---|---|
| 1–Hammer, Complete | $ 1.70 |
| 2–Hammer Pin | .03 |
| 3–Hammer Stirrup | .20 |
| 4–Hammer Stirrup Pin | .02 |
| 5–Safety | .25 |
| 6–Safety Lever | .10 |
| 7–Strut | .25 |
| 8–Strut Spring | .06 |
| 9–Strut Pin | .03 |
| 10–Firing Pin | .15 |
| 11–Firing Pin Rivet | $ 0.02 |
| 12–Hand | .50 |
| 13–Main Spring | .50 |
| 14–Crane | 2.25 |
| 15–Crane Bushing | .10 |
| 16–Crane Lock | .25 |
| 17–Crane Lock Screw | .07 |
| 18–Latch | .75 |
| 19–Latch Spring | .02 |
| 20–Latch Pin | .15 |
| 21–Trigger | $ 1.00 |
| 22–Trigger Pin | .03 |
| 23–Ejector and Ratchet | .75 |
| 24–Ejector Rod | .25 |
| 25–Ejector Rod Head | .15 |
| 26–Ejector Spring | .10 |
| 27–Bolt | .50 |
| Bolt Spring | .03 |
| 28–Bolt Screw | .05 |
| 29–Rebound Lever | .75 |

Continued on next Page

*Extra Price Charged for Target Revolver Parts. In ordering Parts, specify Number of Revolver

# Component Parts of Colt Revolvers

## "POCKET POSITIVE," "POLICE POSITIVE" AND "POLICE POSITIVE TARGET"* REVOLVERS CALIBER .32 -Continued

| No. | Each |
|---|---|
| 30–Rebound Lever Pin | $ 0 03 |
| 31–Stock Pin | 02 |
| 32–Stock Screw | 05 |
| 33–Slide Plate Screw | 05 |
| Frame and Side Plate | 6 50 |
| Side Plate | 80 |
| Cylinder | 3 00 |
| Barrel, 2½ or 3½ in | 1 50 |
| Barrel, 4 or 6 in | 2 00 |
| Recoil Plate | 05 |
| Stocks, per Pair | .75 |
| Escutcheons, per Set | .05 |

*Extra Price charged for Target Revolver Parts.

In ordering Parts, specify Number of Revolver

## "POLICE POSITIVE" AND "POLICE POSITIVE SPECIAL" CALIBER .38

| No. | Each |
|---|---|
| 15–Crane Bushing | $ 0 10 |
| 16–Crane Lock | 25 |
| 17–Crane Lock Screw | 07 |
| 18–Latch | 75 |
| 19–Latch Spring | .02 |
| 20–Latch Pin | 15 |
| 21–Trigger | 65 |
| 22–Trigger Pin | .03 |
| 23–Ejector and Ratchet | 80 |
| 24–Ejector Rod | 25 |
| 25–Ejector Rod Head | .15 |
| 26–Ejector Spring | .10 |
| 27–Bolt | 50 |
| Bolt Spring | 03 |
| 28–Bolt Screw | .05 |
| 29–Rebound Lever | .75 |
| 30–Rebound Lever Pin | 03 |
| 31–Stock Pin | 02 |
| 32–Stock Screw | .05 |
| 33–Side Plate Screw | 05 |
| Frame and Side Plate | 6 50 |
| Side Plate | 80 |
| Cylinder | 3 25 |
| Barrel | 2 00 |
| Recoil Plate | 05 |
| Stocks, per Pair | 75 |
| Escutcheons, per Set | 05 |

| No. | Each |
|---|---|
| 1–Hammer, Complete | $ 1.70 |
| 2–Hammer Pin | .04 |
| 3–Hammer Stirrup | .20 |
| 4–Hammer Stirrup Pin | .02 |
| 5–Safety | .25 |
| 6–Safety Lever | .10 |
| 7–Strut | 25 |
| 8–Strut Spring | $ 0.06 |
| 9–Strut Pin | 03 |
| 10–Firing Pin | 15 |
| 11–Firing Pin Rivet | 02 |
| 12–Hand | .40 |
| 13–Main Spring | .50 |
| 14–Crane | 2 35 |

Specify in ordering whether Police Positive Special or Police Positive

## "DOUBLE ACTION" CALIBERS .38 and .41

| No. | Each |
|---|---|
| 1–Guard | $ 1 50 |
| 2–Strap | 1.25 |
| 3–Ejector Tube | 1.25 |
| 4–Hammer | 1.10 |
| 5–Trigger | 50 |
| 6–Base Pin | .50 |
| 7–Hammer Stirrup | .25 |
| 8–Sear | $ 0 30 |
| 9–Strut | .25 |
| 10–Bolt | .30 |
| 11–Hand | .20 |
| 12–Sear and Bolt Spring | .20 |
| 13–Trigger Spring | .25 |
| 14–Main Spring | .40 |
| 15–Ejector Rod and Head | $ 0 50 |
| 16–Ejector Spring | .10 |
| 17–Gate Spring | 02 |
| 18–Base Pin Catch Spring | 02 |
| 19–Strut Spring | 10 |
| 20–Hand Spring | 10 |
| 21–Stock Screw | 05 |

Continued on Next Page

When ordering Colt Parts, give Number of part, Model and Caliber of Arm

# Component Parts of Colt Revolvers

## "DOUBLE ACTION" CALIBERS .38 and .41-Continued

| No. | Each |
|---|---|
| 22-Hammer Screw | $ 0 05 |
| 23-Trigger Screw | .05 |
| 24-Base Pin Catch Nut | .05 |
| 25-Base Pin Catch Screw | .05 |
| 26-Sear Screw | .05 |
| 27-Gate Catch | .02 |
| 28-Ejector Tube Screw | .05 |
| 29-Front Strap Screw | .05 |
| 30-Main Spring Set Screw | .05 |
| 31-Rear Guard Screw (2) | .05 |
| 32-Main Spring Screw | .05 |
| 33-Trigger Roll | .05 |
| 34-Latch Screw | .05 |
| 35 H[illegible] Strap Screw | .05 |
| 36 Trig[illegible] | .05 |
| 37 Fr[illegible] | .05 |
| 38-Back Strap Screw (2) | .05 |
| Ejector, Rod only | .20 |
| Ejector Head only | .30 |
| Cylinder | 2.25 |
| Barrel with Sight | 1.50 |
| Barrel Sight | .25 |
| Lock Frame | 6.00 |
| Lock Frame Gate | .75 |
| Stocks, per Pair | .75 |
| Escutcheons, per Set | .05 |

## "SINGLE ACTION ARMY" and "BISLEY MODEL" REVOLVERS

| No. | Each |
|---|---|
| 1-Hammer | $ 0.85 |
| 2-Trigger | 22 |
| 3-Hand and Hand Spring | 27 |
| Hand Spring | .03 |
| 4-Gate | 1 00 |
| 5-Ejector Tube | 1.50 |
| 6-Ejector Rod | .27 |
| 7-Ejector Head | $ 0 50 |
| 8-Ejector Spring | 12 |
| 9-Sear and Bolt Spring | .08 |
| 10 Bolt | .28 |
| 11-Base Pin | 42 |
| 12-Base Pin Bushing | 40 |
| 13-Main Spring | 35 |

| No. | Each |
|---|---|
| 14-Gate Spring | $ 0.02 |
| 15-Base Pin Catch | .05 |
| 16 Base Pin Catch Spring | .02 |
| 17 Base Pin Catch Screw | 05 |
| 18-Front Guard Screw | .05 |
| 19-Rear Guard Screw (2) | .05 |
| 20-Ejector Tube Screw | .05 |
| 21-Back Strap Screw (2) | .05 |
| Front Strap Screw | .05 |
| 22-Gate Catch | .02 |
| 23 Gate Catch Screw | 05 |
| 24-Sear and Bolt Spring Screw | .05 |
| 25-Stock Screw | .05 |
| 26-Hammer Screw | .05 |
| 27-Trigger and Bolt Screw | .05 |
| 28-Main Spring Screw | .05 |
| Lock Frame | 6.00 |
| Barrel | 3.00 |
| Barrel Sight | .25 |
| Barrel Stud | .10 |
| Cylinder | 3.00 |
| Firing Pin | .10 |
| Trigger Guard | 1 65 |
| Back Strap | 1.25 |
| Stocks, per Pair | 75 |
| Escutcheons, per Set | 05 |
| Recoil Plate | 05 |
| Firing Pin Rivet | 02 |

For prices of Bisley Parts which are different from corresponding parts of Single Action Army See Below
All other Parts same as of Single Action Army In ordering, give Number of Part

**Extra Price charged for Target Revolver Parts**

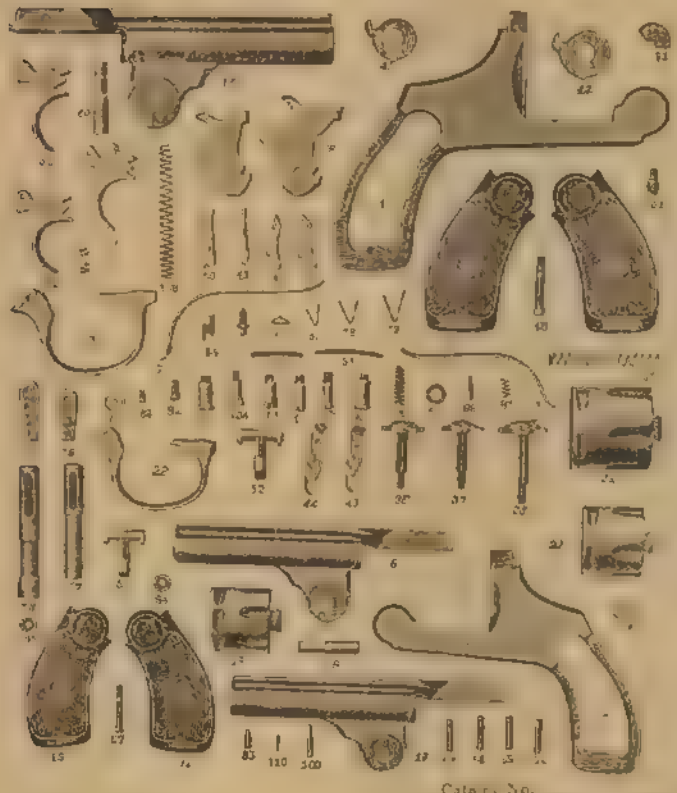
The following Parts are different from the corresponding parts in the Single Action Army

| | Each |
|---|---|
| Hammer | $ 1.00 |
| Hammer Stirrup | .25 |
| Trigger | .40 |
| Main Spring | $ 0.50 |
| Hand and Hand Spring | .30 |
| Hand Spring | .05 |
| Stocks, per Pair | .75 |
| Lock Frame | $ 6.00 |
| Trigger Guard | 1 65 |
| Back Strap | 1 25 |

**When ordering Colt Parts, give Number of Part, Model and Caliber of Arm**

# Component Parts of Iver Johnson Revolvers

## SAFETY HAMMER AUTOMATIC REVOLVERS .22, .32 and .38 Caliber



| Name of Part | Catalog No. .22 Cal. | .32 Cal. | .38 Cal. | Each |
|---|---|---|---|---|
| Frame | 1 | 2 | 3 | $ 1.40 |
| Barrel, 3 in. | 6 | 10 | | 1.50 |
| Barrel, 3¼ in. | | | 15 | 1 50 |
| Barrel, 4 in. | 7 | 11 | 16 | 2 10 |
| Barrel, 5 in. | 8 | 12 | 17 | 2 75 |
| Barrel, 6 in. | 9 | 13 | 18 | 3 37 |
| Barrel, 2 in. | | 14 | | 1 50 |
| Cylinder | 19 | 20 | 21 | .85 |
| Guard | 22 | 23 | 23 | .30 |

| Name of Part | Catalog No. .22 Cal. | .32 Cal. | .38 Cal. | Each |
|---|---|---|---|---|
| Hammer | 26 | 26 | 28 | $ 0.35 |
| Trigger | 31 | 32 | 34 | 40 |
| Extractor | 36 | 37 | 38 | 10 |
| Ext. Stem | 39 | 39 | 40 | 10 |
| Ext. Cam | 41 | 41 | 42 | 15 |
| Lifter | 43 | 43 | 44 | 15 |
| Sear | 47 | 47 | 48 | 08 |
| Lever | 49 | 49 | 50 | 08 |
| Barrel Catch | 51 | 51 | 52 | 25 |
| Trigger Pin | 53 | 53 | 54 | 02 |
| Guard Pin | 55 | 55 | 56 | 02 |
| Quill or Base Pin | 57 | 57 | 58 | .12 |
| Ext. Cam Bushing | 59 | 59 | 59 | .02 |
| Cam Bushing Spring | 60 | 60 | 60 | .02 |
| Joint Screw | 61 | 61 | 62 | .05 |
| Hammer Screw | 63 | 63 | 64 | 04 |
| Stock Screw | 67 | 67 | 68 | 04 |
| Stock Right | 69 | 69 | 70 | .15 |
| Stock Left | 71 | 71 | 72 | 15 |
| Main Spring | 73 | 73 | 75 | .10 |
| Trigger Spring | 76 | 76 | 77 | .06 |
| Lever Spring | 78 | 78 | 79 | .02 |
| Sear Spring | 80 | 80 | 80 | 02 |
| Stock | 81 | 81 | 82 | .04 |
| Lever Pin | 83 | 83 | 83 | .02 |
| Firing Pin | 84 | 85 | 85 | 05 |
| Firing Pin Spring | 86 | 87 | 87 | .02 |
| Firing Pin Screw | 88 | | | 03 |
| Firing Pin Nut | | 89 | 89 | 04 |
| Cylinder Friction Spring | 90 | 90 | 91 | 02 |
| Guard Screw | 92 | 92 | 92 | 05 |
| Head Escutcheon | 94 | 94 | 94 | 02 |
| Thread Escutcheon | 95 | 95 | 95 | 03 |
| Stock Pin | 100 | 100 | 100 | 02 |
| Barrel Catch Bolt | 101 | 101 | 101 | .08 |
| Barrel Catch Screw | 104 | 104 | 105 | .04 |
| Extractor Spring | 107 | 107 | 108 | 04 |
| Lifter Pin | 110 | 110 | 110 | 02 |
| Barrel Catch Spring | 111 | 111 | 93 | 02 |

## SAFETY HAMMERLESS AUTOMATIC REVOLVERS

| Name of Part | Catalog No. 32 Cal. | 38 Cal. | Each |
|---|---|---|---|
| Frame | 4 | 5 | $ 1 40 |
| Barrel, 3 in. | 10 | | 1 50 |
| Barrel, 3¼ in. | | 15 | 1 50 |
| Barrel, 4 in. | 11 | 16 | 2 10 |
| Barrel, 5 in. | 12 | 17 | 2 75 |
| Barrel, 6 in. | 13 | 18 | 3 37 |
| Barrel, 2 in. | 14 | | 1.50 |
| Cylinder | 20 | 21 | .85 |
| Guard | 24 | 25 | .30 |
| Hammer | 29 | 30 | 35 |
| Trigger | 34 | 35 | 40 |
| Extractor | 37 | 38 | .40 |

| Name of Part | Catalog No. 32 Cal. | 38 Cal. | Each |
|---|---|---|---|
| Extractor Stem | 39 | 40 | $ 0 10 |
| Extractor Cam | 41 | 42 | .15 |
| Lifter | 45 | 46 | .15 |
| Lever | 49 | 50 | 08 |
| Barrel Catch | 51 | 52 | 25 |
| Trigger Pin | 53 | 54 | 02 |
| Guard Pin | 55 | 56 | 02 |
| Quill or Base Pin | 57 | 58 | 12 |
| Extractor Cam Bushing | 59 | 59 | 02 |
| Cam Bushing Spring | 60 | 60 | 02 |
| Joint Screw | 61 | 62 | 05 |
| Hammer Screw | 63 | 66 | 04 |

Continued on Next Page

When ordering I J Parts, give Number of Part, and if same is supplied in Nickel and Blue, state which is desired

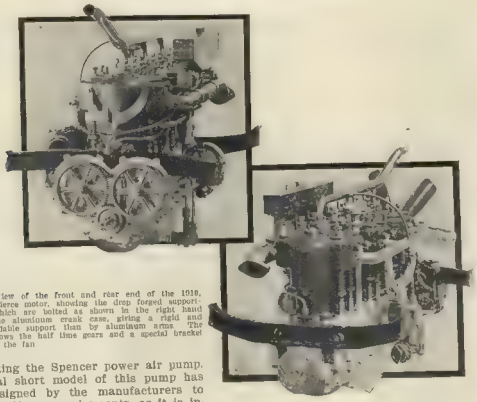


Fig. 3. View of the front and rear end of the 1910, 6-cylinder Pierce motor, showing the drop forged supporting arms which are bolted as shown in the right hand figure to the aluminum crank case, giving a rigid and more dependable support than by aluminum arms. The left view shows the half time gears and a special bracket for carrying the fan

by adopting the Spencer power air pump. A special short model of this pump has been designed by the manufacturers to meet the Pierce requirements, as it is intended to be covered by the hood when

Fig. 4. View of the Spencer Power Air Pump now fitted on all 1910 Pierce cars. This pump is driven by gears from the water pump shaft and is capable of pumping a large tire to 90 pounds pressure in four or five minutes.

not in use. The pump stands vertically, and, together with a bracket and a large bronze pinion fast to its shaft, is bolted directly to the side member of the frame forward on the left side of the motor. It accordingly lies parallel with the shaft of the centrifugal circulating pump. A small bronze pinion on the latter will afford a means of driving the pump. This pinion is so small and so accessible that it is intended to be shifted along its shaft and into or out of engagement, entirely by hand. A spring-controlled ball and recess lock will serve to hold it in place, either when in or out of mesh. Flexible connections are provided to inflate any of the tires. Owing to its location, the air inlets of the pump are provided with fine gauze screens. The motor is to be run at from 400 to 600 R. P. M. when it is desired to operate the pump, and doubtless the slower speed will be found more desirable.

Instead of the gasoline gauge formerly employed on the tank itself a vertical glass gauge mounted directly on the dash has been specified. This will be plainly visible in daylight and may be illuminated at night by means of a push button which serves to supply current to a miniature electric light. Quite as important as the power inflating equipment for the tires, is the provision of a large sized Prest-O-Lite

brake and clutch pedals, and brake and gear-shifting levers necessary in each case. The runabout chassis is special throughout and no other body is made interchangeable with it, the only bodies which have this feature being the touring, landaulet and brougham. The wheelbase of the runabout is 119 inches.

To provide the same ample factor of safety as formerly, in view of the extra load imposed upon it by its changed location, the front axle has been strengthened by making the flanges of the die forging heavier. Greater ease of control of its chief outlets in the shape of much larger tire equipment on every one of the three models listed. On the 36 H. P. touring car, landaulet and brougham, this will be 36 by 4 inch front, and 36 by 4½ inch rear. Apart from the increased mileage, the increased size of the tire equipment also makes for much easier riding. This has been further provided for by the adoption of the three-quarter elliptic spring as the standard for the rear suspension on all the models. While somewhat of a departure, this improvement is only the logical outcome of the adoption

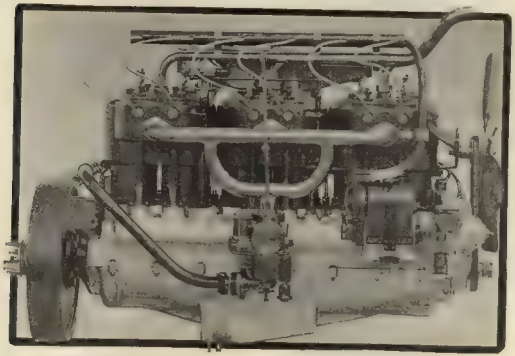


Fig. 2. Inlet side of Pierce 6-48 motor, showing the water jacketed carburetor mounting of the magneto, method of wiring, etc.

has been provided for by increasing the diameter of the steering wheel to 18 inches. To meet this condition, the spark and throttle levers have been made 1 inch longer, and the fulcrum end raised 1⅛ inches, making the quadrant bracket much neater. The running boards have been made two inches wider and the practice of entirely enclosing the space between the running boards and bottom of the under frame by means of a metal apron has been adopted as standard. This serves to entirely enclose the sides of the car between the forward and after mud guards. The latter have also been altered to conform, the front guards now being designed with a straight slope to the rear to facilitate closing in the sides. These guards have also been given a ⅞ inch flange all round.

The desire of the builders to give greatly added value to the Pierce, without putting it on the list price, finds one of this type of spring on the 4-24 and the 6-36 models last year, on both of which it proved very successful. A dropped type of pressed steel frame has accordingly been adopted in order to preserve the body level of the car at the same height, as well as to avoid raising the center of gravity of the machine. This was particularly necessary on the 36 H. P. model in view of making 36 inch wheels standard equipment. With the exception of the runabout, the springs are given 1 inch less arch so that the body is no higher with the 36 inch wheels than it formerly was with the 34 inch.

ADDITIONAL EQUIPMENT.

One or two conveniences have been added as part of the standard equipment of the 1910 models, that will doubtless be appreciated. The Pierce was among the very first to fit the Hartford-Truffault suspension as regular equipment and has now gone a step further in this direction

tank in place of a gas generator. A special compartment for this tank has been designed in the tool box at the rear, and in which it is securely locked out of sight. To avoid the necessity of opening the tool box to turn the gas on or off, a cock is placed just outside. A gas generator will be fitted where specialy ordered, but it will be considered as an extra and must be specified before chassis is assembled.

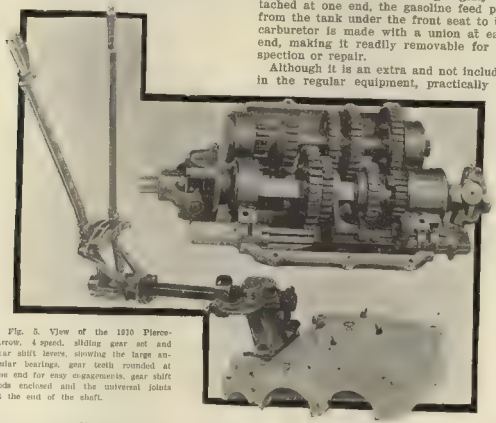


Fig. 5. View of the 1910 Pierce-Arrow, 4 speed, sliding gear set and gear shift levers, showing the large annular bearings, gear teeth rounded at one end for easy engagements, gear shift rods enclosed and the universal joints at the end of the shaft.

IGNITION

While the Bosch high tension magneto is retained as the standard ignition equipment for the service side of this highly important essential, a change has been made in the reserve system by the adoption of six non-vibrating coil units, and a seventh coil with master vibrator, thus greatly simplifying the vibrator adjustment necessary on a six-cylinder coil. The auto coil is specified and the mahogany case embodies a substantial kick switch of the three point type, giving neutral, magneto and battery connections. The two sets of spark plugs are retained, the ½ inch metric standard as well as the location of the plugs remaining unchanged.

In addition to the clamp hitherto provided on all Pierce cars for holding the adjustable ball thrust at the bottom of the steering column in place, an extra locking plate has been provided in order to absolutely guard against any possibility of accidental looseness at this point. The steering column is now given a slope of 50 degrees on the touring car, brougham and landaulet, and this together with the increased diameter of the wheel greatly facilitates the handling of the car in traffic.

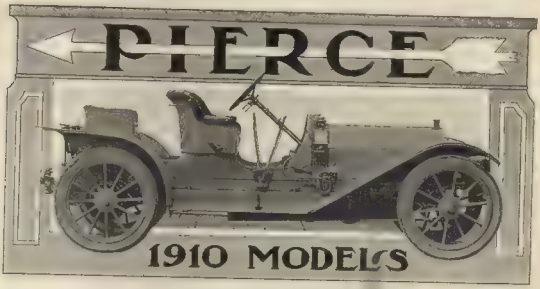
All brake shoe pivots are now provided with bronze bushings instead of being given a direct bearing, and automatic grease cups are specified on all spring shackles. In place of being rigidly attached at one end, the gasoline feed pipe from the tank under the front seat to the carburetor is made with a union at each end, making it readily removable for inspection or repair.

Although it is an extra and not included in the regular equipment, practically all the cars are sold with a windshield, and where ordered, a special divided type will be fitted on the 1910 models.

THE PIERCE 48 H P SIX

The motor dimensions on this car remain the same as on the 1909 model, namely, 4½ by 4¾ inches, bore and stroke, though as is the case with the other engines, its rating does not represent its actual power output. An oil ring has been added on the pistons, and the gear set housing raised ⅝ inch, the remaining changes to the transmission being the same as described on the 36 H. P. car. This also applies to the use of roller instead of ball bearings. The brake drums are of the same diameter as previously but have been increased in width by 3-16 inch. The thickness of the Raybestos lining has also been increased.

On this car, the front axle has been brought forward 4½ inches involving an increase in the wheel base from 130 to 134½ inches. The drop frame is specified and




BY CHARLES B. HAYWARD.

"Sixes," because the Pierce-Arrow Motor Car Company, of Buffalo, N. Y., has definitely decided that for this coming season it will devote its entire attention and manufacturing facilities to the six-cylinder type. Consequently, the entire 1910 line will be comprised of sixes. This not only simplifies manufacturing but has also been responsible for a reduction in the number of models listed. Instead of five distinctive chassis, as was the case with the 1909 output, there are but three for 1910. But as there were two fours, the 4-24 town car and the 4-40 touring type last year, this does not mean an actual reduction in the number of types listed apart from the elimination of the fours. It is with full confidence, not alone in the present status of the six-cylinder type, but likewise in its future, that the Pierce Company has taken this step and the extent to which its faith in the demand reaches is evidenced by the fact that plans have been made for an increase of fully 50 per cent. over last year's production, when both types were turned out.

The 1910 Pierces, the first models of which won the Glidden Tour, are of 36, 48 and 60 H. P. respectively. The first cars turned out were the four entered in the tour, and, owing to the late date at which the last of the 1909 product left the factory, they were only finished a few weeks prior to the start from Detroit. The time available in which to try them out on the road was very limited, particularly in the case of the last two of the quartette to come through. The "thirty-six" is referred to as the "small Pierce," though when compared with current standards it will be evident that it is a large machine in reality, though it has been designed strictly as a five-passenger car.

It goes without saying that no radical changes have been made. Regardless of how perfect a point of development a machine may have been carried to, experience in the manufacture and running of a large number of cars always serves to bring to light minor changes and improvements here and there that will conduce to the greater comfort of the owner, or the better performance of the machine as a whole.

Additions constitute the major part of the improvements, and while small individually, regarded in the aggregate, they are of no inconsiderable moment, particularly when the cost of making them on such a large series of cars as the Pierce Company will turn out for 1910 is taken into consideration. However, the list prices will remain unaltered.

THE PIERCE SIX-THIRTY SIX.

Following the policy just adopted last year, the motor of this car has its cylinders cast in pairs, but the cylinder diameter has been increased by 1-16 inch, or from 3 15-16 to four inches. There has been a corresponding increase in its power output, but as its rating of 36 H. P. is more or less nominal, the motor as formerly constructed showing a capacity in excess of this figure, no change has been made in its rating. Copiousness of lubrication has always been a prominent feature of the Pierce oiling system and as a great deal more oil than necessary was being forced to the cylinder walls, in last year's motor, it has been found advisable to supplement the baffle plates in the crank case by an oil ring on the bottom of the pistons. Experience with this has shown it to give an additional mileage of fully 50 per cent. on a single charge of lubricating oil, beside tending to give a cleaner

length of time, this would impose too great a strain on the differential, but it would always be practical for emergency conditions.

The fulcrum end of the control levers on the steering column has only been raised 1½ inches on this model, the other changes mentioned in this connection on the 36 H. P. type having been carried out in the same manner. This applies also to the changes to the running boards, underguards and aprons, gasoline gauge, spark coils, gas tanks, steering column, thrust bearing, brake shoe pivots, and last but not least, to the fitting of the Spencer power air pump. The convenience of the

Special steel stampings are employed for the brake drums and they have been made one inch wider, the lining being 3-16 Raybestos, as in the others.

The shifting of the front axle forward has brought about an increase in the wheel base from 135 to 140 inches. The three-quarter elliptic springs are standard for the rear suspension and the front springs have been given one inch less arch to preserve the same level. The chassis will be standard for touring, suburban and landau types of bodies, the first named being a seven-passenger as last year, though the body design has undergone a change to accommodate it to the drop

Fig. 8. Pierce 1910 front axle as now fitted with Timken roller bearings.

latter may be appreciated when its ability to inflate the large pneumatics of this car to 90 pounds to the square inch in less than five minutes is taken into consideration. Automatic grease cups are fitted on all spring shackles, this cup being practically integral with the shackle bolt itself.

The luggage carrier is of the same folding type as employed on the 36, something that also applies to the divided wind shield.

Due to the dropped design of the pressed steel chassis frame at the rear, the drop forged brake hanger and in consequence, the brake shoes, have been placed at an angle of 45 degrees. This gives greatly increased leverage and avoids the thrusting of the brake shoes against the drums when the springs are depressed. The gasoline feed pipe has been made with a union at each end, making it much more easily detachable.

PIERCE SIX CYLINDER, 66-HORSEPOWER CAR.

In view of its size and power, this model will naturally constitute but a comparatively small fraction of the Pierce output for 1910, the first series consisting of 100 cars. While it is a continuation of its 60 H. P. predecessor of last year, quite a few minor changes have been made. The separately cast cylinders have been abandoned in favor of the twin type, thus making all three models uniform in this respect. The dimensions are 5¼ by 5½ inches. The changes mentioned in connection with the description of the 36 and 48 H. P. models, where the gear set housing, shifting lever, front axle, wheel bearings and pedals have all been carried out in a similar manner.

frame made necessary by the new type of suspension. The three types of bodies above mentioned have also been standardized so as to be interchangeable on the regular 48 H. P. chassis and 66 H. P. chassis. The steering column has been placed at an angle of 49 degrees from the vertical in all three cases, the runabout and miniature tonneau types being special in this power as well, not being designed to take any other body. They have a 133½ inch wheel base, the front axle being placed directly under the center line of the radiator. The runabout and miniature tonneau bodies for the 66 H. P. chassis have been made interchangeable on the 48 H. P. runabout chassis.

As is the case with the other models, one of the greatest changes made in the new series of cars is to be found in the liberal increase in the size of the tire equipment. On the touring car, landau and suburban types this is 37 by 5 inch front and 38 by 5½ inch rear, while for the miniature tonneau and runabout, it is 37 by 5 inch all round. All the other detailed changes mentioned in the description of the 36 and 48 H. P. chassis, such as the improved arrangement of the control levers, increased size of running boards, continuous apron from front to rear, improved design of the mud guards, adoption of the Spencer power air pump, Prest-O-Lite tank, master vibrator coil set for the emergency ignition, gasoline gauge on dash, bronze bushes in brake shoe pivots, grease cups on all spring shackle bolts, have been carried out according to the same standards on the 66 H. P. chassis.

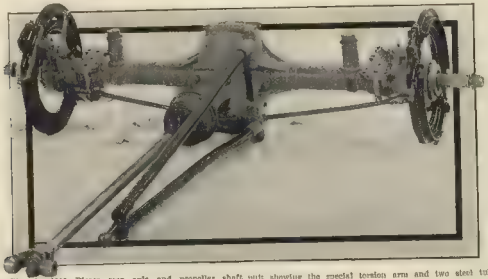


Fig. 6. 1910 Pierce rear axle and propeller shaft unit showing the special torsion arm and two steel tubes, the thorough housing of the rear universal joint, brake arrangements, etc

the semi-elliptic front springs have 2 inches less arch, thus bringing the level of the whole chassis down that much. This has been made possible by the shift in the location of the front axle which takes it away from danger of contact with the crank case.

The three-quarter elliptic springs are standard for the rear. On this car, the steering column is given a rake of 49 degrees from the vertical in the touring, landau and suburban types. The touring body has the same seating capacity and room as the 1909 type, namely, seven passengers, but has altered slightly in design in order to conform to the change brought about by the drop frame. The touring car, landau and suburban bodies are all made interchangeable on both the 48 and 66 H. P. standard chassis. For the runabout and miniature tonneau bodies, the 48 H. P. chassis is special, the wheel base being 128 inches, with the center line of the front axle directly under the front of the radiator. These two bodies will also interchange on the 66 H. P. chassis.

It is in the tire equipment of the 48 H. P. car that a radical departure is to be found. This will consist of 36 by 4½ tires front and 37 by 5 inch rear, this being the first instance in which this new and odd size has been adopted. At first sight it would appear as if this would cause inconvenience, but this is not the case as despite their difference in diameter the front and rear tires are interchangeable. This is made possible by making the tires with exactly the same retaining beads, their only difference of dimension lying in the diameter. The rims employed on all four wheels are accordingly identical. It would doubtless not be good practice to have a 37 inch tire on one driving wheel and a 36 inch on the other, as when used for any

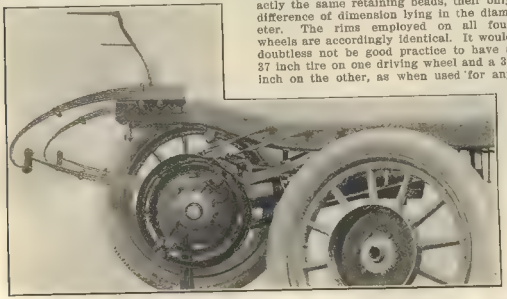
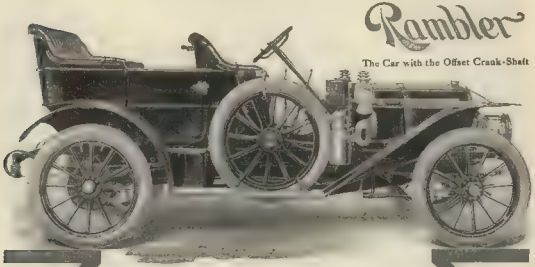


Fig. 7. View of the rear end of the 1910 Pierce chassis showing the three-quarter scroll and elliptic springs, the dropped pressed steel frame slotted to allow the brake cranes ends to protrude, also showing the double set of brakes with the wheel and brake drum removed.



Rambler

The Car with the Offset Crank-Shaft

Model Forty-four, 34 H. P., $2,250.

Spare Wheel, with Inflated Tire, Brackets, and Tools, $74. Magneto, $150.

## *Quality in the Rambler*

That quality of refinement in workmanship and material which dominates every detail of the new Rambler is most apparent when it is compared, part for part, with cars costing hundreds and thousands of dollars more.

The perfection of every detail in the making of this automobile can be attributed to that infinite care and pride in his work which every Rambler mechanic brings to his individual task. The selection, indifferent to cost, of the materials used and the finished skill applied to fashioning each part stamps the Rambler as a car of character.

The Rambler Spare Wheel, Offset Crank-Shaft, and other exclusive Rambler features are but evidences of our constant effort to provide for the comfort and satisfaction of Rambler owners.

May we send you the new Rambler catalog, or a free copy of the Rambler Magazine, a monthly publication for owners? Rambler automobiles, $1,150 to $2,500.

## *Thomas B. Jeffery & Company*

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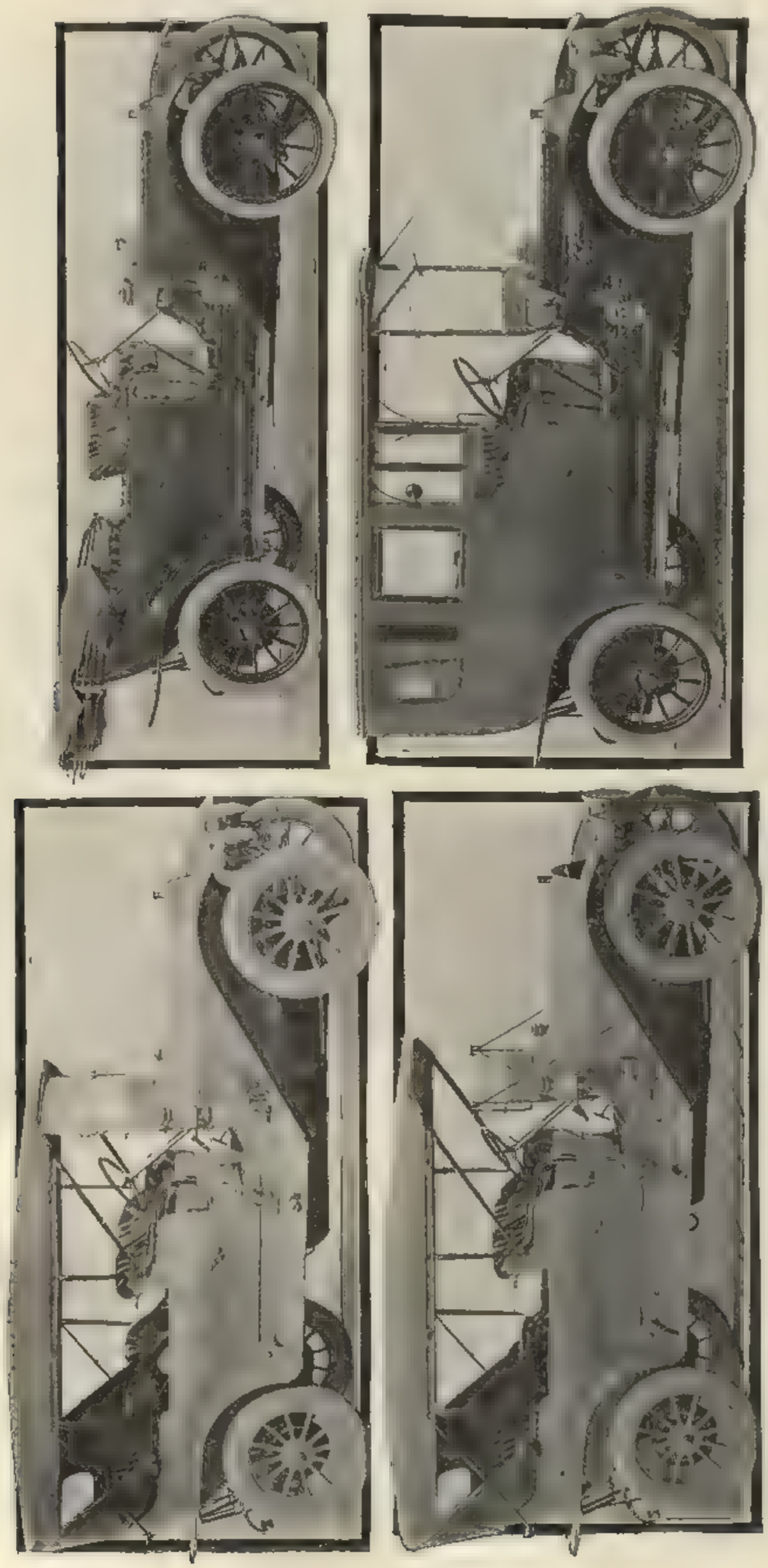


Group of 1910 Pierce-Arrow Models. In the upper left hand corner is shown the Pierce 6-66 seven-sented touring car, a large and powerful machine with ample room for seven passengers. Below it is the 6-48 seven-passenger touring car. In the upper right hand corner is the five-passenger Pierce touring car, known as the [illegible]. The apparent difference in the front and rear tires is in diameter only, the tires being interchangeable on the same rims. In the lower right hand corner is shown the 6-36 [illegible] with a brougham body, and to the headpiece of this article is shown a good view of the large roadster

exhaust and keeping the interior of the motor cleaner. The housing of the gear set has been raised ¼ inch, which admits of reducing the travel of the speed change lever necessary and facilitates operation. The shifting lever itself has also been lengthened 2 inches, while the arrangement of the foot brake and clutch levers has been altered so as to provide for greatly increased leverage, making it much easier to apply the brake or disengage the clutch. Naturally, these are all changes that would not be apparent even upon an actual comparison of a 1910 model with its predecessor, except where particularly when compared with American standards in this respect generally, a further increase has been thought advisable in view of the greater power of the motor. On the 36 H. P. car, the brake drums have been made ½ inch wider and of 1 inch greater diameter, increasing the effective braking surface by almost 20 per cent. Raybestos friction lining is specified and will be 3-16 inch thick, instead of 5-32 inch, as formerly. A great improvement in the appearance of the car has been made by placing the front axle 3½ inches further forward, and by bringing the load entirely between the axles. This also adds

Fig. 1. Exhaust side of Pierce 6-48 motor. This view shows the oiling system with the raised tank in a new position over the exhaust pipe and the method of driving the gear pump which takes the excess oil back into the tank after it has passed into the engine base and been strained. It also shows the water pump fan and the spring seat of the forward end of the pump shaft, the small bronze pinion which drives a power air pump fitted to 1910 Pierce cars.

measurements were taken, but they go to show the amount of thought and study that is devoted to the smallest details of the design and construction.

Probably the most radical change to be found on the entire car is the substitution of Timken roller bearings in the wheels instead of the Hess-Bright formerly employed. On the front wheels, the annular type has been displaced altogether, while on the rear, the bearing equipment now consists of a Hess-Bright inboard bearing and a Timken roller type on the outer end of the axle. The much greater ability of the roller type to withstand heavy thrust loads, even far in excess of its normal radial capacity, has naturally, been responsible for this change on the front wheels.

Despite the fact that Pierce brake area allowances were already unusually liberal, to the riding qualities. It entails an increase of 6 inches in the wheelbase, which is now 125 inches, instead of 119, and also gives an extra 2½ inches of leg room in the tonneau. The width of this body in the rear has also been increased by 3 inches, involving an entirely new set of patterns for the large aluminum castings employed in the Pierce body construction. The foregoing refers to the standard touring type of body, but the miniature tonneau will also be 2½ inches longer, while the brougham and landaulet bodies will be 6 inches longer inside. They will comfortably accommodate three passengers on the rear, and will have two drop seats in addition.

The miniature tonneau and touring bodies will not interchange on the standard chassis owing to the altered locations of the dash, steering column, steering rod,

# Benjamin Multiple Clusters

National Electrical Code Standard

## TYPE 1—EDISON BASE—Diam. 4 Inches

Bushing at lowest point has Knock-out Center to accommodate Lamp Cord for Drop Light or Pendant Switch. Prices include Flange tapped for ⅜ in. Pipe.

| No. | Std. Pkg. | Each |
|---|---|---|
| **12**—2-Light, Multiple | 10 | $ 1 60 |
| **13**—3-Light, Multiple | 10 | 1 85 |
| **14**—4-Light, Multiple | 10 | 2 10 |
| **16**—5-Light, Multiple | 10 | $ 2 35 |
| **16**—6-Light, Multiple | 10 | 2 60 |

Cat. No. 16K

### Type K, Diam. 4 in.

| No. | Std. Pkg. | Each |
|---|---|---|
| **13 K**—3-Light, Multiple | 10 | $ 1 85 |
| **14 K**—4-Light, Multiple | 10 | 2 10 |
| **15 K**—5-Light, Multiple | 10 | 2 35 |
| **16 K**—6-Light, Multiple | 10 | 2 60 |
| **17 K**—7-Light, Multiple | 10 | 2 85 |

Type K—Standard Pull Chain Sockets. For [illegible] three wire [illegible] only second, side lights only, third, center and side lights—add ½ to catalog number and $0.25 to list.

Cat. No. 76

### Type 7, Diam. 4 in.

| No. | Std. Pkg. | Each |
|---|---|---|
| **72**—2-Light, Multiple | 10 | $ 2 60 |
| **73**—3-Light, Multiple | 10 | 2 85 |
| **74**—4-Light, Multiple | 10 | 3 10 |
| **75**—5-Light, Multiple | 10 | 3 35 |
| **76**—6-Light, Multiple | 10 | 3 60 |

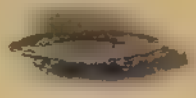
Type 7 has Type [illegible] with [illegible] socket switch, furnished [illegible] metal key so as to operate [illegible] of lamps.

Prices include Flange tapped for ⅜ in. Pipe

## FLANGE BACKS FOR TYPES 1, K AND 7 CLUSTERS

No. 3100

Copper Plated Steel



No. 3124

Black Enam. Steel

No. 3150

Black Enam. Casting

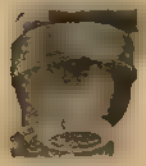
| No. | Std. Pkg. | Each. |
|---|---|---|
| **3100**—Flange Tapped for ⅜ in. Iron Pipe | 10 | $ 0 05 |
| **3123**—Flange for Attaching to 3 in. Outlet Box | 10 | 15 |
| **3124**—Flange for Attaching to 4 in. Outlet Box | 10 | 15 |
| **3150**—Flange Tapped for ½ in. Iron Pipe | 10 | 15 |
| **3175**—Flange Tapped for ¾ in. Iron Pipe | 10 | 15 |
| **3123 B**—Flange with Polished Brass Cover for attaching to 3 in. Outlet Box | 10 | 30 |
| **3124 B**—Flange with Polished Brass Cover for attaching to 4 in. Outlet Box | 10 | 30 |

# Benjamin Multiple Clusters

National Electrical Code Standard

## Type 8—Fibre Lined—Edison Base

### Diam. 2½ Inches



No. 81

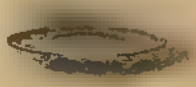
No. 82

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 81 | —1-Light, Multiple | 10 | $0 45 |
| 81F | —1-Light, Multiple, Flange Tapped ⅜ | 10 | 50 |
| 82 | —2-Light, Multiple | 10 | $0 90 |

## FLANGE BACKS FOR TYPE 8 BODIES

With Screws

No. 3800—Copper Plated Steel



No. 3223—Black Enameled Steel

No. 3850 Black Enameled Casting

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 3800 | —Tapped for ⅜ in. Iron Pipe | 10 | $0 10 |
| 3223 | —For Attaching to 3 in. Outlet Box. | 10 | 15 |
| 3224 | —For Attaching to 4 in. Outlet Box. | 10 | 15 |
| 3850 | —Tapped for ½ in. Iron Pipe | 10 | $0 15 |
| 3223B | —With Polished Brass Cover | 10 | 25 |
| 3224B | —With Polished Brass Cover | 10 | 30 |

## Type 2—Edison Base—Diam. 3 in.

No. 22

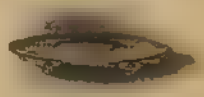
Bushing at lowest point has Knock-out Center to accommodate Lamp Cord for Drop Light or Pendant Switch.

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 22 | —2-Light, Multiple | 10 | $1 35 |
| 23 | —3-Light, Multiple | 10 | $1 60 |

## FLANGE BACKS FOR TYPE 2 BODIES

With Screws

No. 3200—Copper Plated Steel



No. 3223—Black Enameled Steel

No. 3250—Black Enameled Casting

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 3200 | —Tapped for ⅜ in. Iron Pipe | 10 | $0 05 |
| 3223 | —For Attaching to 3 in. Outlet Box. | 10 | 15 |
| 3224 | —For Attaching to 4 in. Outlet Box. | 10 | 15 |
| 3250 | —Tapped for ½ in. Iron Pipe | 10 | $0 15 |
| 3223B | —With Polished Brass Cover | 10 | 25 |
| 3224B | —With Polished Brass Cover | 10 | 30 |

Standard Finish is Polished Brass.

# Benjamin Series Clusters

National Electrical Code Standard

## FIBRE LINED—EDISON BASE

Cat. No 18½

### Type 1½, Diam. 4 in.

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 12½ | 2-Light | 10 | $ 1 60 |
| 13½ | 3-Light | 10 | 1 85 |
| 14½ | 4-Light | 10 | 2 10 |
| 15½ | 5-Light | 10 | 2 35 |

Cat. No 22½

### Type 2½, Diam. 3 in.

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 22½ | 2-Light | 10 | $ 1 60 |
| 23½ | 3-Light | 10 | 1 85 |

## BENJAMIN SERIES—MULTIPLE CLUSTERS

National Electrical Code Standard

### Type SM, Diam. 4 in.

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 14 SM | 4-Light | 10 | $ 2 20 |
| 16 SM | 6-Light | 10 | 2 70 |

### Type KSM, Diam. 4 in.

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 14 KSM | 4-Light | 10 | $ 2 20 |
| 16 KSM | 6-Light | 10 | 2 70 |

Series-Multiple Clusters are for 2 wire connection, in a series-multiple grouping, consisting of sets of two lamps in Series.

## BENJAMIN CLUSTERS

National Electrical Code Standard

Cat. No 32

### Type 3, Diam. 3⅛ in.

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 32 | 2-Light, Multiple | 10 | $ 1 60 |
| 33 | —3-Light, Multiple | 10 | 1 85 |
| 32½ | —2-Light, Series | 10 | 1 60 |

Cat. No 34T

### Type 3T, Diam. 4½ in.

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 32 T | 2-Light, Multiple | 10 | $ 1 75 |
| 33 T | —3-Light, Multiple | 10 | 2 00 |
| 34 T | —4-Light, Multiple | 10 | 2 25 |
| 35 T | —5-Light, Multiple | 10 | 2 50 |
| 36 T | —6-Light, Multiple | 10 | 2 75 |

These Clusters are specially designed for close grouping of Lamps.
Type 3 lends itself for use with Glass Balls or Domes.
Type 3T designed for Tungsten Lamps. The sockets in Nos. 32 and 33 are at an angle of 45 degrees with the vertical, in Nos. 35T and 36T 24 degrees.

# Benjamin Clusters

National Electrical Code Standard

## SEPARABLE MULTIPLE WIRELESS CLUSTER

**Fibre Lined Edison Base**

Cat. No. 56

Cat. No. 55 K

Type 5K with Ornamental Husks

**Type 5, Diam. 4 in.**

| No. | Std. Pkg. | Each |
|---|---|---|
| 52—2-Light, Type 5 Body | 10 | $ 1 60 |
| 53—3-Light, Type 5 Body | 10 | 1 85 |
| 54—4-Light, Type 5 Body | 10 | 2 10 |
| 55—5-Light, Type 5 Body | 10 | 2 35 |
| 56—6-Light, Type 5 Body | 10 | 2 60 |

**Type 5K, Diam. 4 in.**

| No. | Std. Pkg. | Each |
|---|---|---|
| 53 K—3-Light, Type 5K Body | 10 | $ 1 85 |
| 54 K—4-Light, Type 5K Body | 10 | 2 10 |
| 55 K—5-Light, Type 5K Body | 10 | 2 35 |
| 56 K—6-Light, Type 5K Body | 10 | 2 60 |
| 57 K—7-Light, Type 5K Body | 10 | 2 85 |

Diameter of Supporting Base 2⅛ in.

"Turn-Down Feature" for operating lamps in groups is provided by means of an additional binding plate for 3-wire connection. It is regularly furnished with Types 5K Benjamin Separable Wireless Clusters specially designed for multiple-lamp fixtures. They consist of two principal parts separately connected, making it possible to attach or remove the body portion, i.e. finished part, without disturbing the wiring connections. Binding screws are accessible from the front, making slack wire unnecessary. The body portion is attached and held by a reliable bayonet snap lock and may instantly be attached or removed. Any standard screw shade holder may be used. The supporting base of 2⅛ in. diameter is small enough to pass through any ordinary reflector with a 3¼ in. hole. Glassware may therefore be installed or removed without disturbing the connecting wires. Standard finish is polished brass.

# Cluster Body Accessories

**Porcelain Rings**

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 10 | Ring for Benj. Wireless Clusters | 50 | $ 0 05 |

**Ornamental Husks**

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 59 | Ornamental Husks | 50 | $ 0 30 |

Husk for Type 5 and 5K Cluster or any standard Edison Base Socket.

For Special Finishes see Page 1115

# Benjamin Ceiling Fixtures

National Electrical Code Standard

## OPAL REFLECTOR STYLE

Multiple

Cat. No. 522P

### Type 2 Body

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| **522P** | 2-Light | 10 | $ 2 45 |
| **523P** | 3-Light | 10 | 2 70 |

Interior

Cat. No. 515P

### Type 1 Body

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| **512P** | 2-Light | 10 | $ 2 70 |
| **513P** | 3-Light | 10 | 2 95 |
| **514P** | 4-Light | 10 | 3 20 |
| **515P** | 5-Light | 10 | 3 45 |
| **516P** | 6-Light | 10 | 3 70 |

Prices include 14-inch Opal Reflector and adjustable Sun-Base

## ENAMELLED STEEL REFLECTOR STYLE

Cat. No. 14H

### Type 1 Body

| | | Std. Pkg. | Each |
|---|---|---|---|
| **12H** | 2-Light | 10 | $ 3 55 |
| **13H** | 3-Light | 10 | 3 55 |
| **14H** | 4-Light | 10 | 3 80 |
| **15H** | 5-Light | 10 | 4 05 |
| **16H** | 6-Light | 10 | 4 30 |

Cat. No. 14KH

### Type 1 K Body

| | | Std. Pkg. | Each |
|---|---|---|---|
| **13 KH** | 3-Light | 10 | $ 3 55 |
| **14 KH** | 4-Light | 10 | 3 80 |
| **15 KH** | 5-Light | 10 | 4 05 |
| **16 KH** | 6-Light | 10 | 4 30 |
| **17 KH** | 7-Light | 10 | 4 55 |

Prices include Cluster Body less Flange and 15-inch Enamelled Steel Reflector

## OPAL SHADE STYLE

### Type 1 Body

Cat. No. 15G

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| **12 G** | 2-Light, with Opal Shades | 10 | $ 2 10 |
| **13 G** | 3-Light, with Opal Shades | 10 | 2 65 |
| **14 G** | 4-Light, with Opal Shades | 10 | 3 20 |
| **15 G** | 5-Light, with Opal Shades | 10 | 3 75 |

Type 5 Body substituted if so ordered

| | | | |
|---|---|---|---|
| **13 KG** | 3-Light, with Opal Shades | 10 | 2 65 |
| **14 KG** | 4-Light, with Opal Shades | 10 | 3 20 |
| **15 KG** | 5-Light, with Opal Shades | 10 | 3 75 |
| **16 KG** | 6-Light, with Opal Shades | 10 | 4 30 |

Type 5K Body substituted if so ordered

Prices include Cluster Body less Flange, 2¼-inch Shadeholders, and Opal Shades

For Special Finishes, see Page 1113

# Benjamin Pendant Fixtures

National Electrical Code Standard

Cat. No. 022P

## Type 2 Body

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 022 P | 2 Light, 14 in. Opal Reflector | 10 | $ 2 85 |
| 023 P | 3 Light, 14 in. Opal Reflector | 10 | 3 10 |

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 022 H | 2-Light, 15 in. Enam. Steel Reflector | 10 | $ 3 75 |
| 023 H | 3-Light, 15 in. Enam. Steel Reflector | 10 | 4 00 |

## Type 5 Body

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 052 P | 2-Light, 14 in. Opal Reflector | 10 | $ 3 15 |
| 053 P | 3-Light, 14 in. Opal Reflector | 10 | 3 40 |
| 054 P | 4-Light, 14 in. Opal Reflector | 10 | 3 65 |
| 055 P | 5-Light, 14 in. Opal Reflector | 10 | 3 90 |
| 056 P | 6-Light, 14 in. Opal Reflector | 10 | 4 15 |

Type 1 Body substituted if so ordered

## Type 1 Body

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 012 H | 2-Light, 15 in. Enam. Steel Reflector | 10 | $ 4 05 |
| 013 H | 3-Light, 15 in. Enam. Steel Reflector | 10 | 4 30 |
| 014 H | 4-Light, 15 in. Enam. Steel Reflector | 10 | 4 55 |
| 015 H | 5-Light, 15 in. Enam. Steel Reflector | 10 | 4 80 |
| 016 H | 6-Light, 15 in. Enam. Steel Reflector | 10 | 5 05 |

Cat. No. 057KP

## Type 5 K Body

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 053 KP | 3-Light, 14 in. Opal Reflector | 10 | $ 3 40 |
| 054 KP | 4-Light, 14 in. Opal Reflector | 10 | 3 65 |
| 055 KP | 5-Light, 14 in. Opal Reflector | 10 | 3 90 |
| 056 KP | 6-Light, 14 in. Opal Reflector | 10 | 4 15 |
| 057 KP | 7-Light, 14 in. Opal Reflector | 10 | 4 40 |

Type 1K Body substituted if so ordered.

## Type 1 K Body

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 013 KH | 3-Light, 15 in. Enam. Steel Reflector | 10 | $ 4 30 |
| 014 KH | 4-Light, 15 in. Enam. Steel Reflector | 10 | 4 55 |
| 015 KH | 5-Light, 15 in. Enam. Steel Reflector | 10 | 4 80 |
| 016 KH | 6-Light, 15 in. Enam. Steel Reflector | 10 | 5 05 |
| 017 KH | 7-Light, 15 in. Enam. Steel Reflector | 10 | 5 30 |

Prices include Cluster Bodies, 8-inch Stems, Canopies, Crowfeet, Shades and Holders.
Standard length of Stems, 6 inch. Extra lengths, 30c. per foot.
For Special Finishes, see Page 1113

# Benjamin Holophane Arcs

National Electrical Code Standard

Cat. No. 66RN

| No. | Std. Pkg. | Each |
|---|---|---|
| **54 RN**—4-Light for Std. 16 C. P. Lamp | 10 | $12 65 |
| **55 RN**—5-Light, for Std. 16 C. P. Lamp | 10 | 13 40 |
| **56 RN**—6-Light, for Std. 16 C. P. Lamp | 10 | 14 15 |
| **57 RN**—7-Light, for Std. 16 C. P. Lamp | 10 | 15 00 |
| **64 RN**—4-Light, for 40 or 60 Watt Tungsten Lamps | 10 | 17 90 |
| **65 RN**—5-Light, for 40 or 60 Watt Tungsten Lamps | 10 | 19 20 |
| **66 RN**—6-Light, for 40 or 60 Watt Tungsten Lamps | 10 | 20 50 |

This Fixture consists of Cluster Body, 2 Bar Chain suspension, 4½ in. x 4 in. Canopy and Insulating Joint, 4 in. Reflector holder and Holophane reflector shades. Chain and Canopy finished in Black Iron. Other finishes add $2.00 list. Extra length in Black Iron finish add $0.35 per foot list, other finishes $0.55 per foot list. Prices do not include lamps.

# Benjamin Wall Brackets

National Electrical Code Standard

Cat. No. 18

| No. | Std. Pkg. | Each |
|---|---|---|
| **18**—1-Light Multiple Bracket only | 10 | $ 0 50 |
| **19**—2-Light Multiple Bracket only | 10 | 90 |
| **19½**—2-Light Series | 10 | 90 |

Cat. No. 19

Adapted for lighting side walls. Used with any shades. Standard finish, Polished Brass.

# Benjamin Sub-Bases

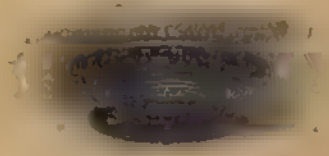
Cat. No. 100

**Metal Sub-Base**

| No. | Std. Pkg. | Each |
|---|---|---|
| **100**—Complete with Rubber Rings and Screws | 20 | $ 0 60 |
| **200**—Complete with Rubber Rings and Screws | 20 | 60 |

Same are to be used with clusters of same type body, No. 100 [illegible] 7 and K bodies. No. 200 fits 2 and 2½ bodies. Are adapted to [illegible] Reflectors firmly between rubber rings and attach directly to ceiling.

Cat. No. 300



Cat. No. 500

| No. | Std. Pkg. | Each |
|---|---|---|
| **300** 3¼ in. Fitter | 20 | $ 1 00 |
| **303**—7 in. Fitter | 20 | 2 50 |
| **500**—Adjustable Sub-Base | 20 | 60 |

No. 300 is used [illegible]

For Special Finishes, see Page 1115.

# Benjamin Tungsten Arcs

National Electrical Code Standard

Cat. No. 0133

## Type 3 Style

### Multiple

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 0132 | 2-Light | 10 | $ 4 50 |
| 0133 | —3-Light | 10 | 4 75 |

### Series

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 0132 | 2 Light | 10 | $ 4 50 |

Specially designed for Tungsten Lamps, but also suitable for ordinary lamps.

Prices are for complete Cluster Fixture with Steel and Reflector Holder of finished Aluminum, 12"x4" Brass Stem, special Top Reflector Holder, 16" Opal Reflector, 4¾"x4" Canopy and Crowfoot.

Cat. No. T45K

Cat. No. 101

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| T 44 | 4-Light, Open Arc | 10 | $ 8 95 |
| T 45 | —5-Light, Open Arc | 10 | 9 25 |
| T 44 K | —4-Light, Open Arc | 10 | 8 95 |
| T 45 K | —5-Light, Open Arc | 10 | 9 25 |
| T 46 K | —6-Light, Open Arc | 10 | 9 55 |

Prices are for Cluster Fixture with special Reflector Holder, 15 in. Stem of wrought iron pipe and 16 in. Prismatic Reflector, 18 in. Open Reflector, 5 and in. Canopy and Crowfoot.
Standard finish: Brush Brass.

### One-Light Holophane Arc

| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 101 | —1-Light Arc | 10 | $ 2 80 |

This Arc consists of Brass Socket, 2"Cut Shade Holder and 12 in. Suspension, including 15 in. Chain, Loops and Nipple, 4¾x4 in. Canopy and Crowfoot.
Holophane Shades extra.
Standard finish is black iron. Other finishes, $1.00 extra.

For Special Finishes see Page 1115

# Blacksmiths Vises

SOLID BOX

Solid Box Blacksmith Vise

| No. | Jaws | Weight | Each |
|---|---|---|---|
| 30 | 3½ | 30 | $11.00 |
| 35 | 3¾ | 35 | 10.00 |
| 40 | 4 | 40 | 10.50 |
| 45 | 4¼ | 45 | 11.00 |
| 50 | 4½ | 50 | 11.50 |
| 55 | 4¾ | 55 | 12.00 |
| 60 | 5 | 60 | 13 00 |
| 65 | 5 | 65 | 14 00 |
| 70 | 5¼ | 70 | 15.00 |
| 80 | 5½ | 80 | 17 50 |
| 90 | 5¾ | 90 | 20 00 |
| 100 | 6 | 100 | 22.00 |
| 120 | 6½ | 120 | 26 00 |
| 140 | 7 | 140 | 33 00 |

# Anvils

C◇C BRAND

Excels in
**Quality, Form and Finish**
Fully Warranted

Base Sizes–80 to 425 Pounds..... Base Per Pound.....

Advances Over Base Sizes

| Weight lbs. | Advance over Base Per 100 lbs. | Weight lbs. | Advance over Base Per 100 lbs. |
|---|---|---|---|
| 10 to 19 | $15.00 | 60 to 69 | $ 1 00 |
| 20 to 29 | 8.00 | 70 to 79 | 50 |
| 30 to 39 | 5 00 | 426 to 625 | .50 |
| 40 to 49 | 3 00 | 626 to 800 | 1 00 |
| 50 to 59 | 2 00 | | |

VULCAN

Face is one solid piece of Tool Steel thoroughly welded to the Body of the Anvil by a Patented process. It is then accurately Ground and Tempered. The Body is made of Superior Pig Iron, being much more solid than Wrought Iron

| No. | Weight lbs. | Each | No. | Weight lbs. | Each |
|---|---|---|---|---|---|
| 0– | 10 | $ 2.75 | 6– | 60 | $ 6.50 |
| 1– | 15 | 3.25 | 7– | 70 | 7 25 |
| 2– | 20 | 4.00 | 8– | 80 | 8 00 |
| 3– | 30 | 4.50 | 9– | 90 | 9 00 |
| 4– | 40 | 5.25 | 10– | 100 | 10.00 |
| 5– | 50 | 6.00 | | | |

# Blacksmith Tools

Solid Cast Steel, Oil Finished

## SWAGES

No. 190–Top Swage

No. 200–Bottom Swage

| No. | Per Pound |
|---|---|
| 190–Sizes ⅜, ½, ⅝, ¾, ⅞, 1, 1¼, 1½, 2, 2½, 3, 3½ and 4 in | $ 0.40 |
| 200–Sizes ⅜, ½, ⅝, ¾, ⅞, 1, 1¼, 1½, 2, 2½, 3, 3½ and 4 in | .40 |

## FULLERS

No. 210–Top Fuller

No. 220–Bottom Fuller

| No. | Per Pound |
|---|---|
| 210–Sizes ⅜, ½, ⅝, ¾, 1, 1¼, and 1½ in | $ 0.40 |
| 220–Sizes ⅜, ½, ⅝, ¾, 1, 1¼, and 1½ in | .40 |

In ordering Bottom Swages or Fullers, always specify size of shank or anvil hole

## SQUARE FLATTER

No. 230–Flatter

| No. | Per Pound |
|---|---|
| 230–Sizes 2, 2½, 3, 3½ and 4 in | $ 0.40 |

## SET HAMMER

No. 250–Set Hammer

| No. | Per Pound |
|---|---|
| 250–Sizes 1¼ and 1½ in | .40 |

## EYE CHISELS

No. 290–Cold

No. 300–Hot

| No. | Per Pound |
|---|---|
| 290–Sizes 1¼ and 1½ in | $ 0.40 |
| 300–Sizes 1¼ and 1½ in | .40 |

## ROUND EYE PUNCH

| No. | Per Pound |
|---|---|
| 270–Sizes ¼, ⅜, ½, ⅝ and ¾ in | $ 0.40 |

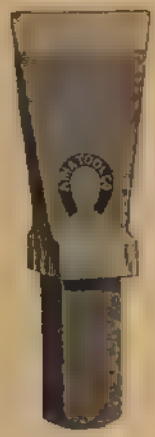
## HEADING TOOL

| No. | Per Pound |
|---|---|
| 280–Sizes ¼, ⅜, ½, ⅝, ¾, ⅞ and 1 in | $ 0.40 |

# Blacksmith Tools

## HARDIES

Half Round



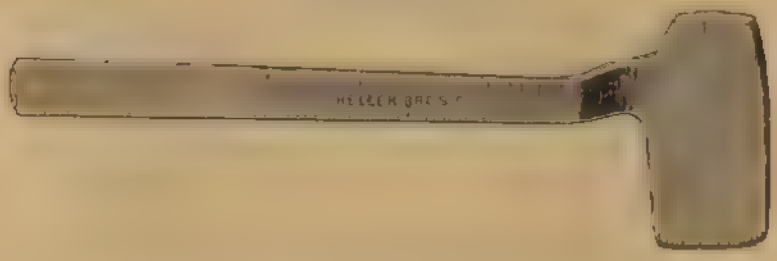
Straight

| No. | | Each | No. | | Per Pound |
|---|---|---|---|---|---|
| 32 | Sizes ¼ and ⅞ in. | $ 0 80 | 310 | Sizes ⅝, ¾, ⅞, 1, 1¼ in. | $ 0 40 |

In ordering Hardies always specify size of Shank or Anvil Hole

# Horseshoers Tools

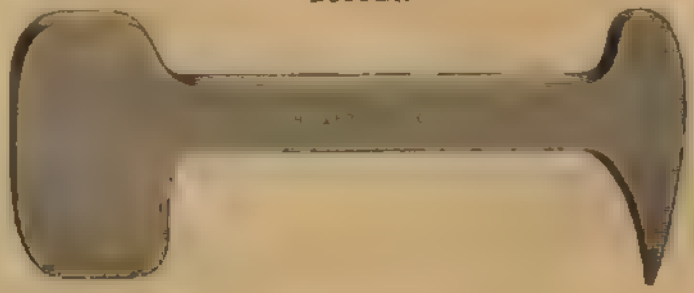
## SOLE KNIFE



| No. | | Per Doz. |
|---|---|---|
| 35 | Heller Bros. Sole Knife | $ 6.00 |

One Doz. in a Box

## BUFFER



| No | | Per Doz. |
|---|---|---|
| 39 | Heller Bros. Buffer | $ 6.00 |

One Doz. in a Box

## PRITCHEL

| No | | Per Doz. |
|---|---|---|
| 30 | Heller Bros Pritchel–12 in. long | $ 3.50 |

One Doz. in a Box

# Blacksmiths Tongs

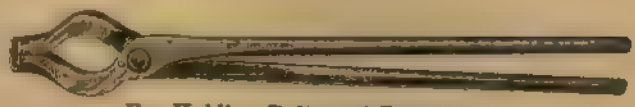
Drop Forged–Solid Steel–Oil Finished

### STRAIGHT LIP

**No. 60**

| Length | Each |
|---|---|
| 18 in | $ 0 60 |
| 20 in | .70 |
| 22 in | .80 |
| 24 in | .90 |

### CURVED LIP GAD



**For Holding Bolts and Round Iron**

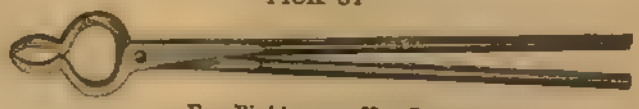
| Holds Iron | Length | Each |
|---|---|---|
| [illegible] in. | 22 in | $ 1 20 |
| ¾ in | 22 in | 1 30 |
| [illegible] in | 24 in | 1 40 |
| 1 in. | 24 in. | 1.50 |
| 1¼ in. | 24 in | 1 60 |
| 1½ in. | 24 in. | 1 70 |

### BOLT

**For Holding Bolts and Rivets**

| Length | Holds Iron | Each |
|---|---|---|
| 20 in. | ½ to ¾ in | $ 1 50 |
| 22 in. | ¾ to 1¼ in | 1 75 |
| 24 in. | 1 to 1½ in | 2 00 |

### PICK UP



**For Picking up Hot Irons**

| Length | Each |
|---|---|
| 22 in | $ 1.75 |

### PICK

**For holding Miners Picks to sharpen**

| Length | Each |
|---|---|
| 24 in | $ 2.00 |

### HORSESHOERS

**Recessed Jaws For Forging**

| No. | Length | Each |
|---|---|---|
| 0– | 12 in. | $ 0.75 |
| 00– | 14 in. | .90 |

### HORSE NAIL CLINCHER TONGS

Heller's Solid Steel–Full Polished

| No. | Length | Per Doz |
|---|---|---|
| 26 | 14 in. | $26.40 |

One-half Doz. in a Box

# Bolt Clippers

**New Easy**

Carefully made of best material, and perfectly adjusted–All parts interchangable

| No. | Capacity | Length | Weight | Each |
|---|---|---|---|---|
| 0 | ⅜ in Bolts | 18 in | 3 lbs | $ 3.75 |
| 1 | ½ in. Bolts | 24½ in. | 5¼ lbs | 5.00 |
| 2 | ⅝ in. Bolts | 30 in. | 8¼ lbs | 7.00 |
| 3 | ¾ in. Bolts | 36 in. | 12½ lbs | 9 00 |

| Extra Cutters | No. | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|
| | Per Pair | $ 1.75. | 2.50 | 3.50 | 4.50 |

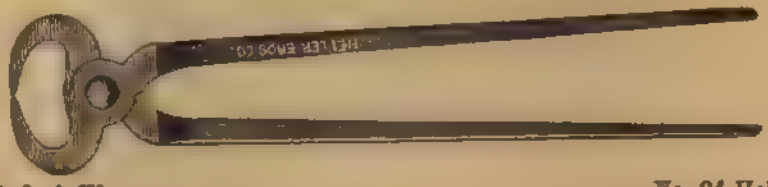
# Hoof Cutting Nippers

Clean Cut

**Clean Cut**

Hand forged from best Tool Steel–Hand finished and perfectly adjusted
Fully Warranted

| No. | Length | Each |
|---|---|---|
| 1 | 14 to 16 in | $ 7.00 |



**P.S. & W.**

Forged Steel–Oil finish–Polished Jaws

| No. | Length | Per Doz. |
|---|---|---|
| 132 | 12 in | $16.00 |
| 134 | 14 in | 18.00 |

One-twelfth Doz. in a Box

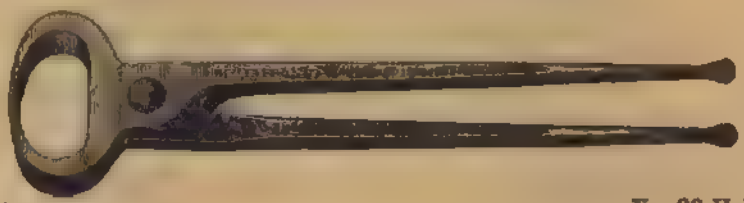
**No. 24 Heller's**

Cast Steel–Full Polished

| Length | Per Doz. |
|---|---|
| 12 in | $24.00 |
| 14 in | 28.80 |

One-half Doz. in a Box

# Blacksmiths Pincers



**Riverside**

Solid Steel–Oil finish–Polished Jaws

| Length | Per Doz. |
|---|---|
| 10 in | $13.00 |
| 12 in | 14.00 |
| 14 in | 15.00 |

One-half Doz. in a Box

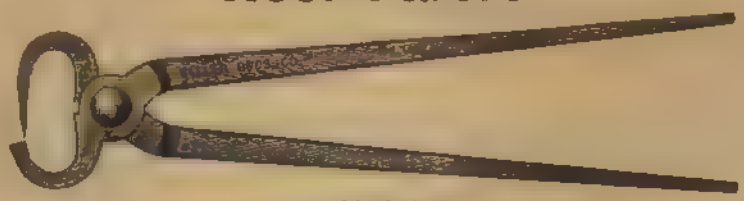
**No. 20 Heller's**

Cast Steel–Oil finish–Polished Jaws

| Length | Per Doz. |
|---|---|
| 14 in | $24.00 |

One-fourth Doz. in a Box

# Hoof Parers



**No. 23 Heller's**

Cast Steel–Full Polished

| Length | Per Doz. |
|---|---|
| 12 in | $24.00 |
| 14 in | 28.80 |

One-half Doz. in a Box

# Tire Upsetters

**Stoddards Lightning**

One man can operate. W[illegible] the Tires on the flat side. With Clamping Head which prevents the tire from Kinking

| No. | | Each |
|---|---|---|
| 2 | 4 in. Machine. Will upset any tire up to 4 in. Wide | $34 00 |
| 3 | 4 in. "Special" Machine. Has sets of Loose Jaws. Can be adjusted for Large or Small Circles, and also for upsetting Axles up to 1¼ in. Thick | $42.00 |

# Tire Measuring Wheel

Accurately Graduated, with Index Hand
Raised Figures, 24 in. Circle

| | Each |
|---|---|
| **Tire Measuring Wheel** | $ 3.00 |

# Swage Blocks

| No. | Size | Approx. Wt. | Per Pound |
|---|---|---|---|
| 1 | 18x18x5 in. | 310 lbs | $ 0.10 |
| 2 | 15x15x4½ in. | 185 lbs. | .10 |
| 3 | 12x12x4 in. | 115 lbs | 10 |

# Blacksmiths Cones or Mandrels

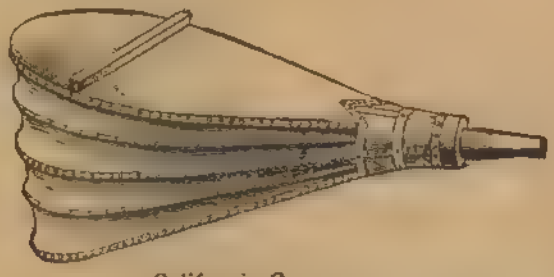
| No. | Height | Diam. Top | Diam. Bottom | Approx. Weight | Per Pound |
|---|---|---|---|---|---|
| 1 | 48 in. | 3½ in. | 16½ in. | 300 lbs. | $ 0.10 |
| 2 | 42 in. | 2½ in. | 12½ in. | 150 lbs. | .10 |

# Blacksmith Bellows

Eastern Pattern

| Size in | 20 | 22 | 24 | 26 | 28 |
|---|---|---|---|---|---|
| Weight lbs. | 20 | 25 | 30 | 35 | 40 |
| Each | $10.00 | 10.00 | 10.00 | 11.00 | 12.00 |

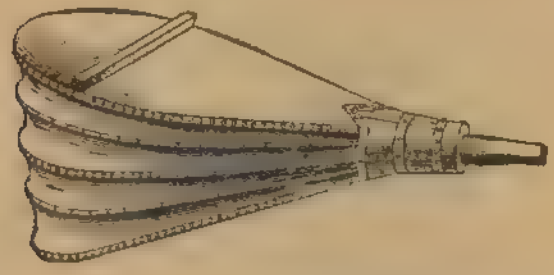
| Size in. | 30 | 32 | 34 | 36 | 38 | 40 |
|---|---|---|---|---|---|---|
| Weight lbs. | 45 | 50 | 60 | 70 | 80 | 90 |
| Each | $13.00 | 14.00 | 16.00 | 18.00 | 20.00 | 25.00 |



California Common

| Size in. | 20 | 22 | 24 | 26 | 28 | 30 |
|---|---|---|---|---|---|---|
| Weight lbs. | 30 | 35 | 40 | 45 | 50 | 55 |
| Each | $10.00 | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 |

| Size in. | 32 | 34 | 36 | 38 | 40 |
|---|---|---|---|---|---|
| Weight lbs. | 60 | 70 | 80 | 90 | 100 |
| Each | $16.00 | 17.00 | 19.00 | 21.00 | 22.50 |



California Standard

| Size in | 24 | 26 | 28 | 30 | 32 |
|---|---|---|---|---|---|
| Weights lbs. | 40 | 45 | 50 | 60 | 70 |
| Each | $12.00 | 13.00 | 14.00 | 15.00 | 16.00 |

| Size in. | 34 | 36 | 38 | 40 |
|---|---|---|---|---|
| Weight lbs. | 80 | 90 | 100 | 110 |
| Each | $17.00 | 19.00 | 21.00 | 22.50 |

With either Screw or Regular Nozzle

California, Extra Long

| Size in. | 36 | 38 | 40 | 42 |
|---|---|---|---|---|
| Weights lbs. | 100 | 120 | 140 | 160 |
| Each | $27.00 | 28.50 | 30.00 | 31.50 |

| Size in. | 44 | 46 | 48 | 50 |
|---|---|---|---|---|
| Weight lbs. | 180 | 200 | 220 | 240 |
| Each | $44.00 | 57.50 | 72.00 | 87.50 |

Eastern, Extra Long

| Size in. | 38 | 40 | 42 | 44 |
|---|---|---|---|---|
| Weight lbs. | 100 | 105 | 110 | 115 |
| Each | $24.00 | 28.00 | 34.00 | 40.00 |

When ordering California or Eastern **Extra** Heavy Bellows state Screw or regular Nozzles

# Hand and Moulders Bellows

Hand

| Size | Per Doz |
|---|---|
| 6 in | $12.00 |
| 8 in | 16.00 |
| 10 in | 20.00 |

Moulders

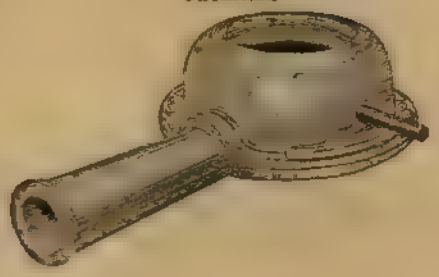
| Size | Per Doz |
|---|---|
| 10 in | $40.00 |
| 12 in | 48.00 |
| 14 in | 56.00 |

# Tuyere Irons

### DUCK NEST

| No. | Weight | Each |
|---|---|---|
| 5– | 12 lbs. | $ 1.50 |
| 10– | 16 lbs. | 2 00 |

### CLARKS



With Ball Valves

| No. | Weight | Each |
|---|---|---|
| 1– | 16 lbs. | $3.00 |
| 2– | 20 lbs. | 3.50 |
| 3– | 30 lbs | 4.50 |

# Power Blowers

**Scientific**

Heavy Steel Shaft–Strongly made and perfectly balanced. For Forge Fires, conveying dust from Emery Wheels, Ventilating, Etc.

No platform or other frame is required, but they can be fastened direct to the wall, ceiling or floor and blast made to discharge in any direction without an elbow.

| No. | Fan | Opening | Capacity |
|---|---|---|---|
| 00 | – 8 in. Diam. | For 2 in. Pipe | 1 Forge Fire |
| 0 | –12 in. Diam. | For 3 in. Pipe | 2 Forge Fires |
| ½ | –18 in. Diam. | For 4 in. Pipe | 3 Forge Fires |

| No. | Each |
|---|---|
| 00– | $ 8.00 |
| 0– | 12.00 |
| ½– | 18.00 |

# Electric Blacksmith Blower

**Champion—One Fire—Variable Speed.**

Practical experience has demonstrated that each Blacksmith Fire should have its Individual Blower. The mechanic can control the speed of the Motor and Blast of the Fan, producing just the required heat with greatest economy in electric current.

This Motor has five different speeds, producing five different blasts, which will meet every requirement from a light fire to a fire that will put a welding heat on a four inch axle in the shortest possible time. Fan 9 in. diam., Outlet for 3 in. pipe. Wood base 9x11 in.

| No. | Current | Cycles | Volts | Each |
|---|---|---|---|---|
| 1 | Alternating | 60 | 110 | $18.00 |

Weight 35 lbs.

NOTE—Motors for Direct Current or other Cycles and Voltages than above can be furnished from factory only. Prices on application.

# JACKS

Fig. 690A

Nos. 0 to 4

## Jenne Track Jacks

| No. | Each | Hght. with Rise of Bar Down | Bar Up | Weight | Capacity |
|---|---|---|---|---|---|
| 0 | $16.00 | 27" | 10" | 40 lbs. | 3 tons |
| 1 | 20.00 | 31" | 12" | 60 lbs. | 5 tons |
| 2 | 24.00 | 35" | 15" | 90 lbs. | 10 tons |
| 4 | 22.00 | 22" | 7" | 55 lbs. | 10 tons |

Fig. 690B

Front View

Fig. 690C

Back View

## No. —— Stone Jack

This Jack has been in the market for many years and has proven to be a great labor saving device for Lifting, loading, and moving purposes.

| Tonnage | Height, inches | Weight, lbs. | Each |
|---|---|---|---|
| 2 | 34 | 95 | $ 45.00 |
| 3 | 34½ | 110 | 50.00 |
| 4 | 35 | 120 | 55.00 |
| 5 | 36 | 135 | 62.00 |
| 6 | 36½ | 150 | 70.00 |
| 8 | 37 | 185 | 84.50 |
| 10 | 37½ | 200 | 110.00 |

Fig. 690D

Fig. 690E

## Chapman Screw Jack

| No. | 4 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|
| Height closed | 30 in. | 36 in. | 42 in. | 48 in. | 54 in. |
| Safe rise with load | 12 in. | 18 in. | 24 in. | 42 in. | 48 in. |
| Height, open to limit | 42 in. | 54 in. | 66 in. | 90 in. | 102 in. |
| Diam. of screw | 1¾ in. | 2¼ in. | 2¾ in. | 3¼ in. | 3¾ in. |
| Each | $7.50 | $11.50 | $15.50 | $21.50 | $30.00 |
| Height closed | 30 in. | 36 in. | 42 in. | 48 in. | 54 in. |
| Safe rise with load | 9 in. | 12 in. | 16 in. | 30 in. | 36 in. |
| Height, open to limit | 39 in. | 48 in. | 58 in. | 78 in. | 90 in. |
| Diam. of screw | 1¾ in. | 2¼ in. | 2¾ in. | 3¼ in. | 3¾ in. |
| Each | $7.50 | $11.50 | $15.50 | $21.50 | $30.00 |

## JACKS

Fig 685A

No. 01, Buckeye Auto Jack

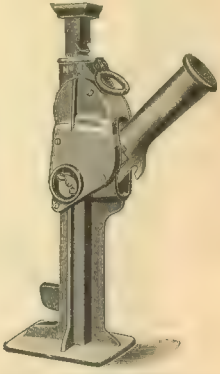
This Jack is designed especially for automobiles the principle being the same as Nos 2 and 19. Its construction is such that the load cannot be accidently dropped . They can, also, be used in many other capacities, as the load can be raised by the foot at the bottom as well as at the top of the rack. They operate at any angle.

| No. | Capacity in Tons | Height Bar Down inches | Raise of Bar inches | Height Bar Raised inhces | Size of Bar inches | Weight Pounds | Each |
|---|---|---|---|---|---|---|---|
| 01 | 1 | 12 | 6 | 18 | 1 x ½ | 8¼ | $5.00 |

Fig 685B

No. 1 Track or Trip Jack

Fig. 685C



No. 3 Automatic Lowering Jack

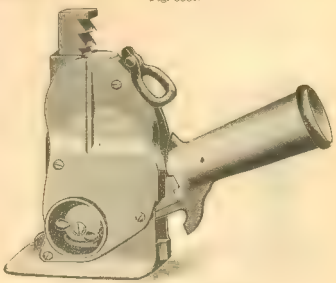
| No | Capacity in Tons | Height Bar Down inches | Raise of Bar inches | Height Bar Raised inches | Size of Bar inches | Weight Pounds | Each |
|---|---|---|---|---|---|---|---|
| 1 | 10 | 24 | 13½ | 37½ | 1½ x 1½ | 62 | $18.00 |
| 2 | 10 | 21 | 10 | 31 | 1½ x 1½ | 65 | 25.00 |
| 3 | 12 | 26½ | 15 | 41½ | 1½ x 1½ | 85 | 30.00 |
| 4 | 15 | 23 | 10 | 33 | 2 x 2 | 100 | 35.00 |
| 5 | 15 | 28 | 15 | 43 | 2 x 2 | 115 | 40.00 |

## JACKS

Fig. 686A

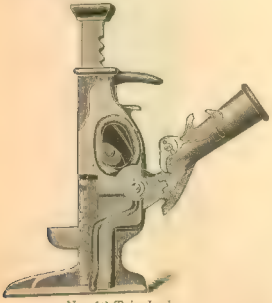
Ballast Gang Trip Jack No. 6

Fig. 686B



No 8 Automatic Lowering Jack

Fig 686C



No. 12 Trip Jack

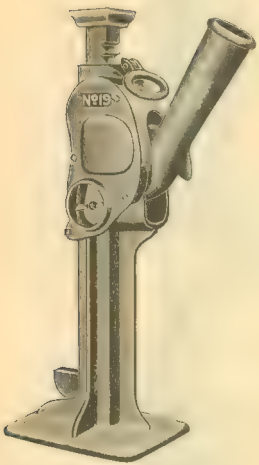
Fig 686D

No. 17 Trip Jack

| No | Capacity in Tons | Height Bar Down inches | Raise of Bar inches | Height Bar Raised inches | Size of Bar inches | Weight Pounds | Each |
|---|---|---|---|---|---|---|---|
| 6 | 15 | 31 | 19 | 50 | 1 x 1 | 105 | $32.00 |
| 8 | 10 | 11 | 5 | 16 | 1 x 1 | 48 | 22.00 |
| 12 | 10 | 17 | 8 | 25 | 1 x 1 | 50 | 27.00 |
| 17 | 10 | 24 | 13 | 37 | 1 x 1 | 63 | 36.00 |

## JACKS

Fig. 687A




No. 19 Automatic Lowering Jack

Fig. 687B

No 20 Ballast Gang Track Jack

Fig. 687C

Nos. 22, 50 Automatic Lowering Jack

| No. | Capacity in Tons | Height Bar Down inches | Raise of Bar inches | Height Bar Raised inches | Size of Bar inches | Weight Pounds | Each |
|---|---|---|---|---|---|---|---|
| 19 | 15 | 28 | 17 | 45 | 2 x 2 | 102 | $35 00 |
| 20 | 15 | 31 | 19 | 50 | 1 x 1 | 106 | 32 00 |
| 22 | 10 | 18⅛ | 8 | 26½ | 1½ x 1⅝ | 66 | 25 00 |
| 50 | 8 | 16 | 8 | 24 | 1¼ x 1¼ | 33 | ..... |

# JACKS

Fig. 688A

## No. 1 Simplex Track Jack

Double Acting Trip

Capacity, 10 tons; Lift, 13½ in.; Height, 24 in.; Weight, 65 lbs.; No. of pieces, 8

Each ..... $18.00

Fig. 688B

## No. 14 Simplex Car Jack

Single Action—Automatic Lowering Operative at any Angle

For terminals and paved track work this single action-automatic lowering Jack is preferred to a trip Jack.

Capacity, 15 tons; Lift, 10 inches; Height, 23½ inches; Weight, 73 lbs.; No. of pieces, 11.

Each ..... $40.00

Fig. 688C

## No. 10 Simplex Car Jack

Single Action—Automatic Lowering Operative at any Angle

For street cars, boiler setting and machinery moving, the No. 10 Simplex Jack is particularly adapted, being operative at any angle, automatic lowering and equipped with a 4 prong swivel cap.

Capacity, 10 tons; Lift, 12½ in., Height 23 in., Weight, 47 lbs.; No. of pieces, 11.

Each ..... $25.00

Fig. 688D

## No. 15 Simplex Car Jack

Single Action—Automatic Lowering Operative at any Angle

For car shops, wrecking cars and industrial plants the No. 15 Simplex Car Jack is perfect.

Capacity, 15 tons; Lift, 17½ in.; Height, 28 in., Weight, 86 lbs.; No. of pieces, 11.

Each ..... $35.00

# JACKS

Fig. 689A

## No. 30 Simplex Car Jack

Double Action—Automatic Lowering, Operative at any Angle

The No. 30 Double Acting Simplex Jack is appreciated by piece work mechanics, being very rapid, raising and lowering on the upward and downward stroke of the lever.

Capacity, 30 tons; Lift, 16¼ in.; Height, 27 in.; Weight, 172 lbs.; No. of pieces, 20.

Each .....$125.00

Fig. 689B

## No. 31 Simplex Car Jack

For loaded cars, locomotives and all classes of heavy work, this No. 31 Simplex Single Acting, Heavy Capacity Simplex Jack demonstrates perfection of design, construction and operation.

Capacity, 35 tons; Lift, 16¼ in.; Height, 27 in.; Weight 175 lbs.; No. of pieces, 20.

Each .....$135.00

Fig. 689C

## No. 36 Simplex Car Jack

Single Action—Automatic Lowering Operative at any Angle

For passenger and coach work the No. 36 Single Acting Simplex Jack has been especially designed.

Capacity, 35 tons; Lift, 26½ in.; Height, 36 in.; Weight, 215 lbs.; No. of pieces, 20.

Each .....$150.00

# JACK SCREWS

Fig 691A

Fig 691B

Fig 691C

| Diameter of Screw inches | Height of Stand inches | Price | Diameter of Screw inches | Height of Stand inches | Price |
|---|---|---|---|---|---|
| 1 ¼ | 4 | [illegible] | 2 ¼ | 8 | $7.70 |
| 1 ¼ | 6 | [illegible] | 2 ¼ | 8 | [illegible] |
| 1 ¼ | 8 | 3.40 | 2 ¼ | 12 | [illegible] |
| 1 ¼ | 10 | 3.80 | 2 ¼ | 14 | [illegible] |
| 1 ¼ | 12 | 4.20 | 2 ¼ | 16 | [illegible] |
| 1 ¼ | 14 | 4.60 | 2 ¼ | 18 | [illegible] |
| 1 ½ | 4 | 3.25 | 2 ½ | 20 | [illegible] |
| 1 ½ | 5 | 3.50 | 2 ½ | 22 | [illegible] |
| 1 ½ | 6 | 3.75 | 2 ½ | 24 | [illegible] |
| 1 ½ | 8 | 4.25 | 2 | 6 | [illegible] |
| 1 ½ | 10 | 4.75 | 2 | 6 | [illegible] |
| 1 ½ | 12 | 5.25 | 2 | 8 | [illegible] |
| 1 ½ | 14 | 6.00 | 2 | 10 | [illegible] |
| 1 ½ | 16 | 6.75 | 2 ½ | 12 | [illegible] |
| 1 ¾ | 6 | 4.50 | 2 ½ | 14 | [illegible] |
| 1 ¾ | 8 | 5.00 | 2 ½ | 16 | [illegible] |
| 1 ¾ | 10 | 5.75 | 2 ½ | 18 | [illegible] |
| 1 ¾ | 12 | 6.25 | 2 ½ | 20 | [illegible] |
| 1 ¾ | 14 | 6.75 | 2 ½ | 22 | [illegible] |
| 1 ¾ | 16 | 7.50 | 2 ½ | 24 | [illegible] |
| 1 ¾ | 18 | 8.50 | 2 ½ | 26 | [illegible] |
| 2 | 5 | 5.00 | 2 ½ | 28 | [illegible] |
| 2 | 6 | 5.25 | 2 ½ | 30 | [illegible] |
| 2 | 8 | 6.00 | 2 ½ | 32 | [illegible] |
| 2 | 10 | 6.75 | 3 | 14 | [illegible] |
| 2 | 12 | 7.50 | 3 | 16 | [illegible] |
| 2 | 14 | 8.25 | 3 | 18 | [illegible] |
| 2 | 16 | 9.25 | 3 | 20 | [illegible] |
| 2 | 18 | 10.25 | 3 | 22 | [illegible] |
| 2 | 20 | 11.50 | 3 | 24 | [illegible] |
| 2 | 22 | 12.50 | 3 | 26 | [illegible] |
| 2 | 24 | 13.50 | 3 | 28 | [illegible] |
| 2 ¼ | 6 | 7.00 | 3 | 30 | [illegible] |

| Inch Screws | Capacity tons | [illegible] of stand [illegible] | Inch Screws | [illegible] [illegible] | [illegible] [illegible] [illegible] [illegible] |
|---|---|---|---|---|---|
| 1 ¼ | 10 | 2 ½ | 2 ½ | 24 | 3 [illegible] |
| 1 ½ | 12 | 2 ½ | 2 ½ | 28 | 4 |
| 1 ¾ | 16 | 2 ¾ | 3 | 36 | 4 |
| 2 | 20 | 3 ¼ | | | |

Levers will be sent only when ordered. Price per lb., $0.05.

## HYDRAULIC JACKS

Fig 692A

Fig. 692B

Nos. 690, 713

### Dudgeon's Universal Horizontal.

This type is intended to meet the demand for a compact, light-weight hydraulic jack, easily handled, operated and controlled, and adapted to meet the conditions imposed by the heavy and diversified lifting of the present day.

THE DOUBLE PUMP. When the load is light, the double pump will raise it with twice the speed of the single pump. When the load is heavy, a quarter turn of the valve handle will throw out one pump and give the action of a single pump jack.

Nos. 30, 60

| No. | Lift—Tons | Runout—in. | Height—in. | Size of Oval Base—Inches | Weight—Pounds | Each |
|---|---|---|---|---|---|---|
| 690 | 30 | 12 | 22 | 12½ x 9 | 234 | $200 00 |
| 691 | 30 | 18 | 28 | 12½ x 9 | 286 | 230 00 |
| 692 | 40 | 12 | 22 | 13½ x 10 | 320 | 240 00 |
| 693 | 40 | 18 | 28 | 13½ x 10 | 355 | 280 00 |
| 694 | 50 | 12 | 22 | 14 x 12 | 336 | 260 00 |
| 695 | 50 | 18 | 28 | 14 x 12 | 380 | 330 00 |
| 696 | 60 | 9 | 17 | 14 x 12 | 320 | 240 00 |
| 697 | 60 | 12 | 20 | 14 x 12 | 350 | 275 00 |
| 698 | 60 | 18 | 26 | 14 x 12 | 410 | 320 00 |
| 699 | 80 | 9 | 19 | 15 x 13 | 425 | 340 00 |
| 700 | 80 | 12 | 23 | 15 x 13 | 450 | 365 00 |
| 701 | 80 | 18 | 28 | 15 x 13 | 525 | 425 00 |
| 702 | 100 | 9 | 19 | 17 x 14½ | 520 | 400 00 |
| 703 | 100 | 12 | 23 | 17 x 14½ | 570 | 475 00 |
| 704 | 100 | 18 | 28 | 17 x 14½ | 660 | 575 00 |
| 705 | 125 | 9 | 19 | 18 x 16 | 535 | 425 00 |
| 706 | 125 | 12 | 23 | 18 x 16 | 585 | 500 00 |
| 707 | 125 | 18 | 28 | 18 x 16 | 685 | 525 00 |
| 708 | 150 | 12 | 23 | 20 x 18½ | 930 | 800 00 |
| 709 | 150 | 18 | 29 | 20 x 18½ | 1,160 | 975 00 |
| 710 | 200 | 12 | 24 | 20 x 18½ | 950 | 800 00 |
| 711 | 200 | 18 | 30 | 20 x 18½ | 1,240 | 1000 00 |
| 712 | 250 | 12 | 25 | 20 x 20 | 1,400 | 1,225 00 |
| 713 | 250 | 18 | 31 | 20 x 20 | 1,650 | 850 00 |

### Dudgeon's Double Pump Railroad Jack.

This type is intended to meet the demand for a compact, light-weight hydraulic jack, easily handled, operated and controlled, and adapted to meet the conditions imposed by large locomotives and cars, and the ever heavy and diversified lifting of the present day.

THE DOUBLE PUMP. It contains a double pump, and with the exception of the large size type, the only jack offering such advantage. When the load is light the double pump will raise it with, twice the speed of the single pump. When the load is heavy, a quarter turn of the valve handle will throw out one pump and give the action of a single pump jack.

| Lift—Tons | Runout—inches | Height—inches | Dia. of base—ins. | Weight—Pounds | Each |
|---|---|---|---|---|---|
| 30 | 9 | 21 | 12 | 160 | $160.00 |
| 30 | 12 | 25 | 12 | 206 | 185.00 |
| 30 | 18 | 32 | 13 | 255 | 990.00 |
| 40 | 12 | 26 | 14 | 270 | 250.00 |
| 40 | 18 | 32 | 14 | 310 | 260.00 |
| 50 | 12 | 27 | 15 | 315 | 250.00 |
| 50 | 18 | 33 | 15 | 360 | 300.00 |
| 60 | 12 | 27 | 16 | 320 | 300.00 |

# Block Planes

## STANLEY

| No. | Length | Cutter | Each |
|---|---|---|---|
| 100 | 3½ in. | 1 in | $ 0.25 |

| No. | Length | Cutter | Each |
|---|---|---|---|
| 102 | 5½ in. | 1¾ in | $ 0.40 |

Adjustable

| No. | Length | Cutter | Each |
|---|---|---|---|
| 103 | 5½ in. | 1¼ in | $ 0.55 |

| No. | Length | Cutter | Each |
|---|---|---|---|
| 110 | 7½ in. | 1¾ in | $ 0.55 |

Double Ender, Has Two Seats and Two Cutter Seats
Can be used to Plane close up to Corners

| No. | Length | Cutter | Each |
|---|---|---|---|
| 130 | 8 in | 1¾ in | $ 0.75 |

Adjustable

| No. | Length | Cutter | Each |
|---|---|---|---|
| 220 | 7½ in. | 1¾ in | $ 0.75 |
| 203 | 5½ in. | 1¾ in | 0.75 |

## BAILEY, ADJUSTABLE

| No. | Length | Cutter | Each |
|---|---|---|---|
| 9½ | 6 in. | 1¾ in | $ 1.10 |
| 15 | 7 in. | 1¾ in | 1.20 |
| 15½ | 7 in. | 1¾ in Rosewood Handled | 1.40 |
| | | Nickel Trimmings | |
| 16 | 6 in. | 1¾ in | 1.25 |
| 17 | 7 in. | 1¾ in | 1.35 |

Low Angle

| No. | Length | Cutter | Each |
|---|---|---|---|
| 60½ | 6 in. | 1¾ in | $ 1.10 |
| 65½ | 7 in. | 1¾ in | 1.20 |
| | | Nickel Trimmings | |
| 60 | 6 in. | 1¾ in | 1.25 |
| 65 | 7 in. | 1¾ in | 1.35 |

Knuckle Joint, Nickel Trimmings

| No. | Length | Cutter | Each |
|---|---|---|---|
| 18 | 6 in. | 1¾ in | $ 1.30 |
| 19 | 7 in. | 1¾ in | 1.40 |

Double End
Can be used as a Block or Bull Nose Plane

| No. | Length | Cutter | Each |
|---|---|---|---|
| 131 | 8 in. | 1¾ in | $ 1.50 |

All Above, Packed One in a Box

# Fancy Iron Planes

## STANLEY RABBET AND BLOCK

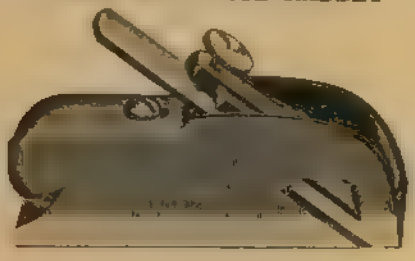
Detachable Plate changes from Rabbet to Block
Cutter set on a skew

| No. | Length | Cutter | Each |
|---|---|---|---|
| 140 | 7 in. | 1¾ in. | $ 1.40 |

## STANLEY CARRIAGE MAKERS RABBET

| No. | Length | Cutter | Ea. |
|---|---|---|---|
| 10½ | 9 in. | 2⅛ in. | $ 2.75 |
| 10 | 13 in. | 2⅛ in. | 3.30 |

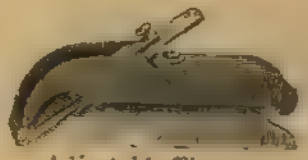
## UNION BULL NOSE RABBET



Adjustable Throat

| No. | Length | Cutter | Each |
|---|---|---|---|
| 50 | 4 in. | 1 in. | $ 0.55 |

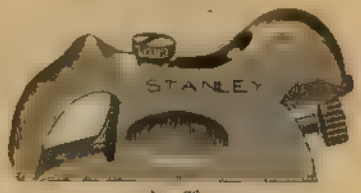
## STANLEY BULL NOSE RABBET



Adjustable Throat

| No. | Length | Cutter | Each |
|---|---|---|---|
| 75 | 4 in. | 1 in. | $0.40 |

## STANLEY CABINET MAKERS RABBET




No. 90

Nos. 92 93 and 94

Nickel plated Both Cutter and Throat Opening are adjustable can be used right or left

| No. | Length | Cutter | Each |
|---|---|---|---|
| 90 | 4 in. | 1 in. | $ 2.20 |
| 92 | 5½ in. | ¾ in. | $ 2.20 |
| 93 | 6½ in. | 1 in. | 2.60 |
| 94 | 7½ in. | 1¼ in. | 3.00 |

## STANLEY SIDE RABBET

For Side Rabbeting and Trimming Dados, Mouldings and Grooves of all sorts. A Reversible Nose Piece will give the Tool a form by which it will work close up into corners when required

| No. | Length | Each |
|---|---|---|
| 98 | Right Hand, 4 in. | $ 1.00 |
| 99 | Left Hand, 4 in. | $ 1.00 |

All Above Packed One in a Box

# Fancy Planes

## STANLEY IMPROVED RABBET

Will lie perfectly flat on either side and can be used with either Right or Left hand when planing into corners or up against perpendicular surfaces. Iron Stock, Fitted with Depth Gauge.

Without Spur

| No. | Length | Cutter | Each |
|---|---|---|---|
| 180 | 8 in. | 1⅝ in | $ 1.10 |
| 181 | 8 in. | 1¼ in | 1.10 |
| 182 | 8 in. | 1 in | 1.10 |

With Spur

| No. | Length | Cutter | Each |
|---|---|---|---|
| 190 | 8 in. | 1⅝ in | 1.25 |
| 191 | 8 in. | 1¼ in | 1.25 |
| 192 | 8 in. | 1 in | 1.25 |

## STANLEY RABBET AND FILLETSTER

The Arm to which the Fence is secured can be screwed in to either side of the stock, making a Right or Left Hand Filletster. With Adjustable Spur and Depth Gauge. Remove the Arm to which the Fence is secured and a handled Rabbet Plane is made with two seats for the Cutter and can be used as a Bull Nose Rabbet.

| No. | Length | Cutter | Each |
|---|---|---|---|
| 78 | 8¼ in. | 1⅝ in | $ 1.65 |

## STANLEY LOW ANGLE BLOCK

Adapted for use in cutting across the grain on heavy work, where more power is required than can be obtained by the use of the ordinary Block Plane. Is fitted with patent adjustable throat, which enables the user to work equally well on hard or soft wood.

| No. | Length | Cutter | Each |
|---|---|---|---|
| 62 | 14 in. | 2 in | $ 2.85 |

## STANLEY FURRING

A new tool for preparing lumber as it comes roughly sawed from the mill, to remove the fur and grit before using a smooth Plane.

The construction of the Bottom is such that it will accomplish this very rapidly.

| No. | Length | Cutter | Each |
|---|---|---|---|
| 340 | 10 in. | 2 in | $ 1.65 |

## STANLEY ADJUSTABLE CIRCULAR

By means of a graduated scale on the gears the face can be accurately set to work an Arc of the same circle, both convex and concave, by turning the Knob on the front of the plane.

| No. | Cutter | Each |
|---|---|---|
| 113 | 1¼ in | $ 3.00 |

## VICTOR CIRCULAR

The ends of the flexible face being fixed and the force applied at the center, great accuracy of adjustment is possible and the face is held firmly in position.

Nickel-Plated

| No. | Cutter | Each |
|---|---|---|
| 20 | 1¼ in | $4.10 |

All Above Packed One in a Box

# Fancy Iron Planes

## STANLEY WOODWORKERS ROUTERS

No. 71 Open Throat

No. 71½ Closed Throat

For Carpenters Cabinet Makers Stair Builders, Pattern Makers and Wheelwrights

The Bits can be clamped to back side of the upright post and outside of stock. In this position they will plane into corners, will router out mortises for Sash Pulleys, or will smooth surface not easily reached by any other tool The attachment shown in the small Cut is furnished with each Plane It can be substituted for the Collar that holds the Cutter when the Plane requires a plane with a closed Throat

| No. | | Each |
|---|---|---|
| 71 | –Nickel Plated Stock, with Steel Bits ¼ and ⅜ in.. | $ 2 05 |
| 71½ | –Nickel Plated Stock, with Steel Bits ¼ and ⅜ in.. | 1.65 |

## STANLEY CORE BOX

Used by Pattern Makers, Wheelwrights, etc., for planing out semi-circles
Packed with one pair of additional section2½ inches wide

| No. | | Each |
|---|---|---|
| 57 | –Works Semi-Circles up to 5 in. Diameter | $ 4.40 |

## STANLEY DOUBLE END MATCH

With both Tongue and Groove Irons, with one side a Tongue can be cut and by reversing ends cuts a Groove to fit.

Nickel Plated
Matches ¼ in. Boards. Cuts Groove ¼ inch.

| No. | | Each |
|---|---|---|
| 148 | | $ 2.20 |

## STANLEY TONGUING AND GROOVING

With two separate Cutters When the Guide or Fence is set (as shown) both Cutters work and a Tongue can be made. The Fence is hung on a pivot and can be swung around end for end. This movement covers one of the Cutters and also furnishes a guide for Grooving an exact match for the Tongue Nickel Plated.

| No. | | Each |
|---|---|---|
| 48 | –For ¼ to 1¼ in. Boards | $2.75 |

All above Packed One in a Box

# Fancy Iron Planes

## STANLEY IMPROVED DADO

The Cutter is set on a skew. Fitted with a Depth Gauge, adjustable by means of a Thumb Screw, also with two Adjustable Spurs, which can be adjusted to take up wear as well as for Depth of Cut

| No. | | Each |
|---|---|---|
| 39–8 in. long. | Width of Cutter ¼, 5/16, ⅜, 7/16, ½, 9/16 and 1 in. | $ 1.65 |

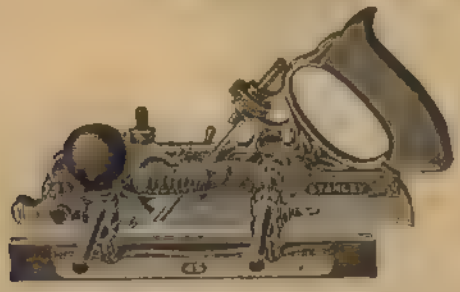
Always give width of Cutter in ordering

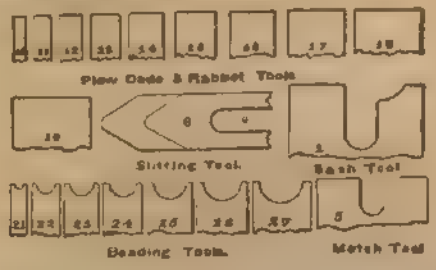
## TRAUTS ADJUSTABLE DADO, FILLETSTER, PLOW, ETC.

This Tool is accompanied by eight Plow and Dado Bits (3/16, ¼, 5/16, ⅜, ½, 5/8, 7/8 and 1¼ in.), a Filletster Cutter, a Slitting Blade and a Tonguing Tool. All (except the Slitting Blade) are secured in the main stock on a skew

| No. | | Each |
|---|---|---|
| 46–Nickel Plated Stock and Fence | | $ 8.00 |

## STANLEY ADJUSTABLE BEADING, RABBET AND MATCHING





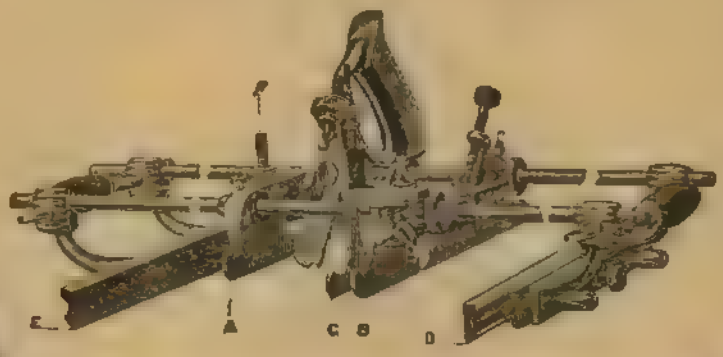

**The Plane combines a Main Stock and a sliding section so arranged that Cutters of different widths can be used. Each Plane is fitted with an Adjustable Fence or Guide and a Depth Gauge, and also with spurs for use in working across the grain; can be used either Right or Left Hand.**

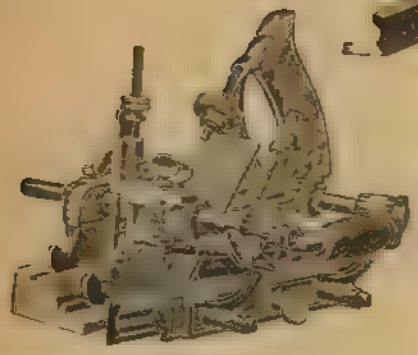
This Plane embraces 1–Beading and Center Beading Plane, 2 Rabbet and Filletster 3 Dado, 4–Plow; 5–Matching Plane; 6–Sash Plane, 7 A Superior Slitting Plane. Each Plane has seven Beading Tools (1/16, 3/32, ⅛, 5/32, 3/16 and ¼ inch) ten Plow and Dado Bits (⅛, 3/16, ¼, 5/16, ⅜, 7/16, ½, 5/8, ¾ and 7/8 inch), a Slitting Blade, a Tonguing Tool and a Sash Tool.

| No. | | Each |
|---|---|---|
| 45–Nickel Plated, with Twenty Tools | | $ 9 00 |

All Above Packed One in a Box

# Fancy Iron Planes

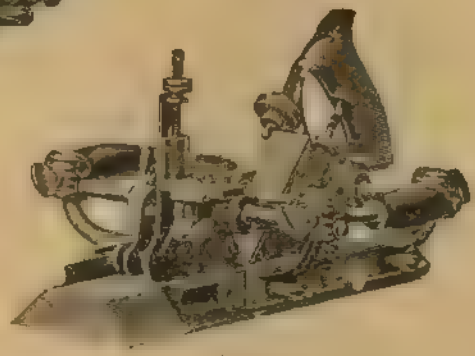


As Moulding Plane

## STANLEY PATENT UNIVERSAL PLANE No. 55

This tool in the hands of an ordinary carpenter can be used on all lines of work covered by a full assortment of "Fancy" Planes.



As Chamfer

The Plane consists of —

*A Main Stock* (A), with two sets of transverse spring arms, a depth gauge (F) adjusted by a screw, and a Slitting Cutter with stop.

*A Sliding Section* (B) with a patent device for adjusting and clamping the cutter.

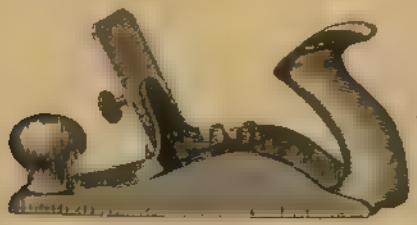
*The Auxiliary Center Bottom* (C) is to be placed in front of the Cutter, as an extra support, or stop, when needed. This bottom is adjustable both vertically and laterally.

*Fences D and E.* Fence D has a lateral adjustment by means of a screw, for ordinary work. The fences can be used on either side of the Plane and the rosewood guides can be tilted to any desired angle, up to 45°, by loosening the screws on the face. Fence E can be reversed for Center Beading wide boards.

*An Adjustable Stop* to be used in beading the edges of matched boards is inserted on the left hand side of Sliding Section (B).

| No. | | Each |
|---|---|---|
| 55 | Universal, Nickel Plated, with 52 Cutters, in a Wooden Box | $18.00 |

## ADJUSTABLE SCRAPER PLANE



For Scraping and Finishing Veneers or Cabinet Work
Can be used as Tooth Plane

| No. | Length | Cutter | Each |
|---|---|---|---|
| 112 | 9 in. | 3 in. | $ 2 20 |

## STANLEY RABBET CABINET SCRAPER

Tilting Rosewood Handle and Knob

| No. | Length | Cutter | Each |
|---|---|---|---|
| 85 | 8 in. | 2 in. | $ 3.00 |

## ADJUSTABLE VENEER SCRAPERS

| No. | Cutter | No. 12 | Each |
|---|---|---|---|
| 12 | 3 in. | Iron Face | $ 2 50 |
| 12½ | 3 in. | Wood Face | 3.30 |

All Above Packed One in a Box

## STANLEY CABINET SCRAPER

Stationary Rosewood Handle and Knob

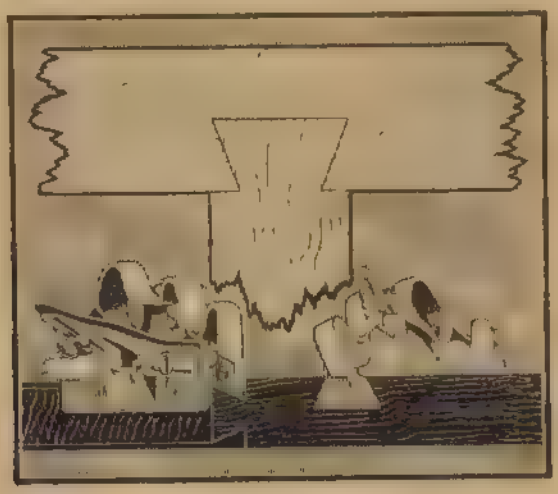
| No. | Length | Cutter | Each |
|---|---|---|---|
| 87 | 8 in. | 2 in. | $ 2 00 |

# Stanley Scrub Plane

For Roughing down before using a Jack Plane
Has Single Iron with Cutting Edge Rounded.

| No. | Length | Each |
|---|---|---|
| 40 | 9½ in | $ 1.10 |

# Stanley Dovetail Tongue and Groove Plane



No. 444

For making Dovetail Tongue and Groove Joints of all descriptions not less than one-quarter inch wide nor more than three-quarter inch deep. An illustrated circular giving full description and instructions for operating packed with each Plane.

| No. | Each |
|---|---|
| 444 | $6.00 |

Put up complete in a strong Wooden Box

# Stanley Scrapers

**No. 81. Cabinet Scraper**

10 in. Raised Handles. 2½ in. Cutter. Nickel Plated. Bottom faced with Rosewood

No 81 ..... Each $1 50

One in a Box

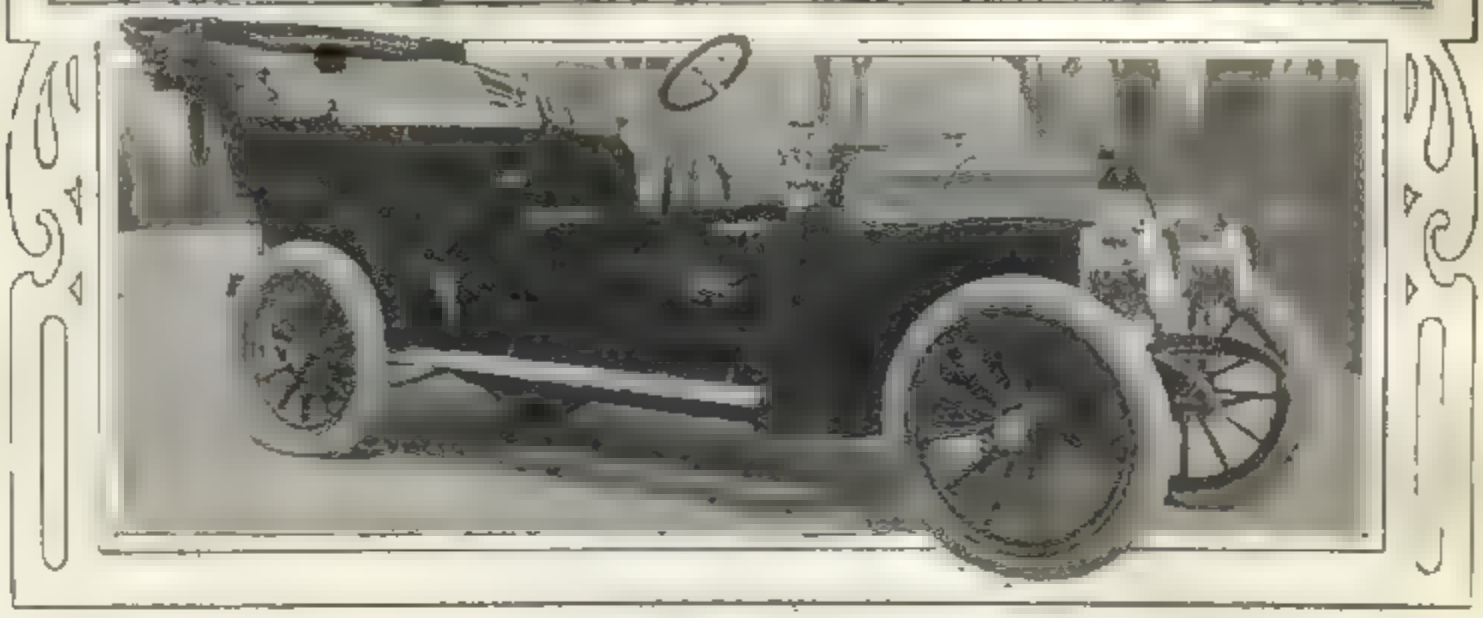
**No. 82. Cabinet Scraper**

14½ in. long. 3 in. cutter. Maple Handle. Blade can be set at any angle desired.

No 82 ..... Each $ 1 05

One in a Box

# The 1909 Simplex Cars



HUGH DOLNAR.

The Simplex Automobile Company, foot of 83d Street and East River, New York City, U. S. A., will offer for the season of 1909 a 60 H. P. chassis, two different lengths of wheel base, 124 and 129 ins., respectively, and a 90 H. P. runabout, seats for four passengers, 124 ins. wheel base, guaranteed speed with four passengers 90 miles per hour.

The entire 1909 Simplex production will be handled by the Palmer & Singer Mfg Co., 1624 Broadway, New York City, sole selling agent.

The Simplex general design of chassis here shown and described was first placed on the road in January, 1907, and the first delivery to a purchaser was made in May, 1907. This chassis has been the subject of constant road tests for two years, and it is claimed with the somewhat unusual result of showing no defects, faults or deficiencies whatever in the general design, the oiling system being the only principal element modified, that now in use being an original forced feed, Franquist design. It consists of four unobstructed oil leads from a constant pressure, oil force pump, ensuring a constant quantity of lubricant per crank shaft revolutions for each bearing supplied by this novel mechanical oiler.

This entire chassis is from original designs and selections by Mr. G. E. Franquist, a machinist by trade, who began at the bottom and has acquired his engineering education by actual practice in many different shops in varied lines of production. Mr. Franquist's attention was first directed specifically to the motor car in 1900, and he has since that time designed five different models of chassis, all in the line of what might be called standard practice of the date, this Simplex 1907-9 being the final outcome of his efforts.

This 1909 Simplex chassis thoroughly

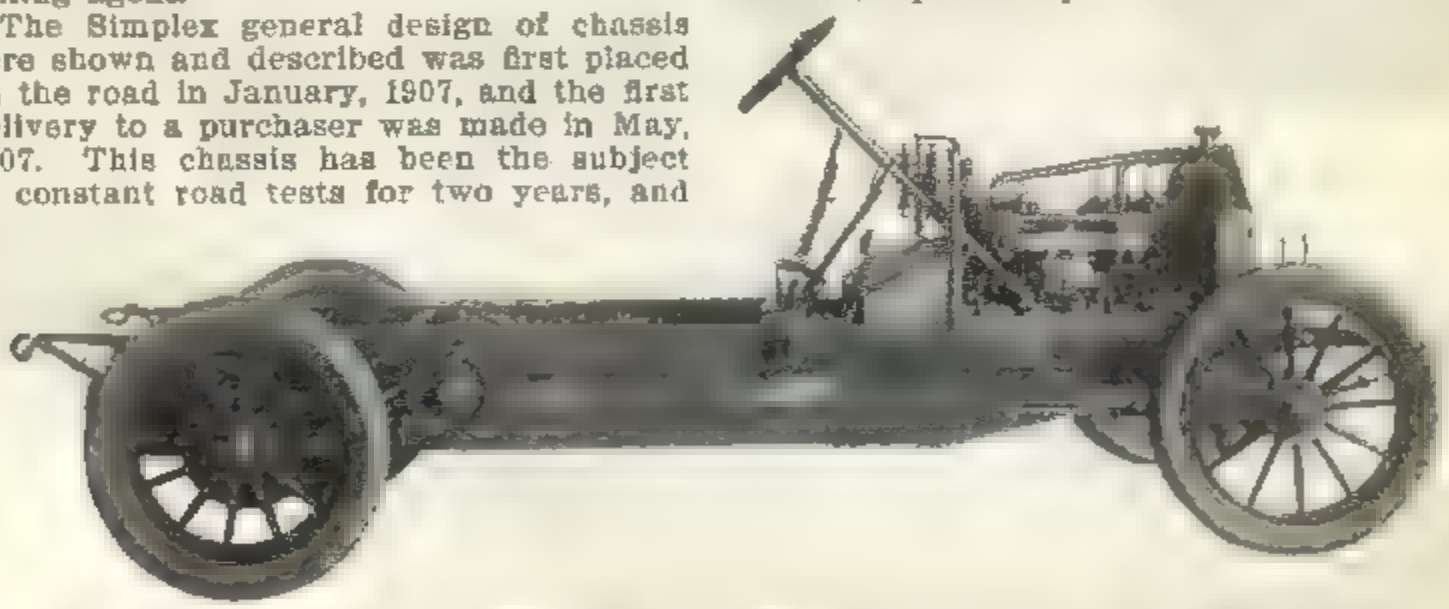


Fig. 1. Simplex 1909 7-passenger touring car chassis. Wheel base, 129 inches; gauge, 56 inches; tires, 36 x 4 inches front, 36 x 5 inches rear, purchaser's option as to make of tires. Motor, four cylinders, 5 x 5½, 4-cycle, water cooled, 60 H. P. at 1,800 R. P. M. High speed reduction ratio, crank shaft to drivers, 2 to 1, regear at purchaser's option. Clutch 76 disks, bronze and steel alternating, flooded lubrication, four forward speeds, selective, and a reverse sliding gear, direct on high speed with bevel gear and bevel balance gear to countershaft, sprockets and side chains to rear wheels. Two brake drums on the countershaft, and one internal brake drum, 15¾ inches inside diameter on each rear wheel. Weight of chassis, 2083 lbs. Price of touring car with 7-passenger Quinby body, $5350, with lamps, generator, tire carrier, robe rail and trunk rack. Top and slip covers extra. 50 H. P. Limousine, $6350. 30 H. P. Baby Tonneau, $5250.

tried out by two years of constant road work and believed to represent the very best practice now known in motor car construction, shows no marked novelty at any point, save in the oiler and carburetor The Simplex chassis bases its claims to excellence on careful selection of materials, general suitability of design, harmonized proportions and thorough construction throughout, rather than on any marked divergence from accepted practice. The axles, chassis frame, crank shaft, transmission shaft and gearings are all Krupp forgings, all chrome nickel steel.

All transmission shafts are in Hess-Bright ball bearings. The crank shaft front bearing is an F. & S. ball bearing, the other two crank shaft bearings are plain "Fahrig" metal. The springs are American make. All gears are chrome nickel steel, and all shafting is heat treated. The front and rear wheels are on Hess-Bright ball bearings.

on four lugs on the side frames. The motor base and oil basin are aluminum castings. The gear box forward support is two chassis frame side brackets; the rear end is supported by two lugs, bolts suspended from the third chassis frame members. The counter-shaft is in fixed annular bearings, no universal joints or globed bearings The propulsion is by struts, screw-adjusted between the rear axle and the counter-shaft brackets. The side chains, Diamond, 1¼ pitch x 5-6 roller length and diameter, are without casing. The sprockets are all soft, chain rollers all hardened.

GEAR BOX AND COUNTER SHAFT

The principal feature of this very carefully designed assemblage is the support of all shafts on ball bearings, with no plain bearings whatever. The forward member of the line shaft is a flanged cup, having the integral side-shaft driving pinion between the flange and cup, which runs in an exterior ball bearing and also carries an

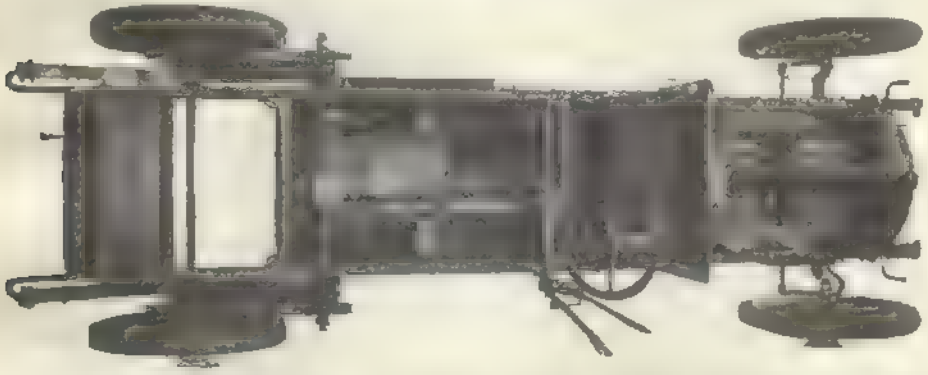


Fig. 2. Simplex 50 H. P. chassis plan. The radiator sits on rubber packing, ½ inch thick, is not fastened to the chassis frame at the sides is held at the foot by two studs, 7 16 inch diameter, which have nuts underneath the front cross part top member The studs are tapped into hubs integral with the radiator sole plate. The top rail for [illegible] does not serve as the [illegible] hinge pin, a separate round [illegible] passed to carry the [illegible] the front board and toe-board arm of wood the top [illegible] carries [illegible] steel risers which have flanges turned inward on the top and front sides. The mahogany front board is supported on hand-forged steel brackets and is brass-bound ends and top edge.

NOTABLE FEATURES

Chrome nickel and open hearth steels are used as suited to requirements. Annular ball bearings are used everywhere except for the second and third crank shaft bearings

The rear hub brakes are gray iron shoes, cam-rocker expanded in a steel, hydraulic-forging brake-drum. The counter-shaft brake-drums are steel castings with external, jointed, steel, drop forging shoes, 3-hole lever applied, copper-faced hand-screw adjusted. All brakes work metal to metal dry. Both front and rear axles are I-section drop forgings, no weld, Krupp chrome nickel steel. The chassis frame is by Krupp, chrome nickel steel, sides and cross members made by Krupp. all cold riveted in the Simplex shops. The frame sides and end cross-members have wood strips, ⅜x2 ins., applied to their top sides, fitted on underside to take frame-top projections, so as to avoid fitting the underside of the chassis frame top. The chassis frame has four cross members. The motor base is

internal ball bearing which takes the forward end of the gear-box line-shaft, which is commonly carried in a plain bearing and is often a source of trouble. These two cup-carried ball bearings are approximately in the same plane, and can therefore act as a universal joint of limited movement without injurious stress.

Another notable feature about this gear-box and counter shaft assembly is found in the oil-throwing flanges which prevent the gear-box lubrication from being transferred to the brake drums fixed to the balance gear casing hubs. The bevel balance gears, 5 d. p. 22 teeth with the 2 pinions are case hardened and are 1⅛ ins. face x 4 2-5 ins. pitch dia., giving ample strength. All gears are Krupp chrome nickel steel drop forgings, all hardened. The change gears are all 6, d. p., with faces varying from 1⅛-in. to 1⅜-in. for the change gears. The bevel gear to the balance gear drum is, pinion 33 teeth, 5, d. p., gear 44 teeth, x 1⅛ face. The smallest change gear has 18 teeth, the largest has 42 teeth.

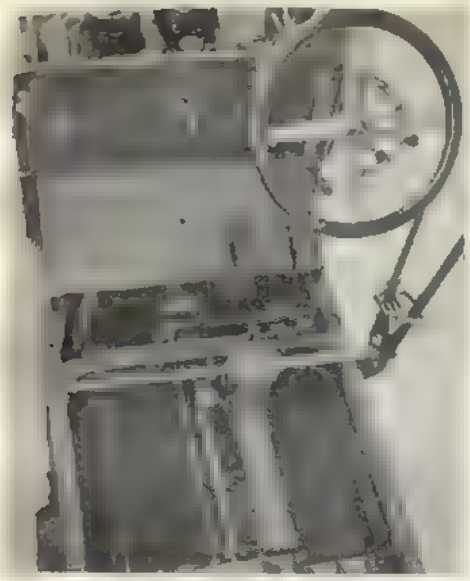


Fig. 4. Simplex 50 H. P. chassis, plan of toe board and control. The gasoline tank air pump and pressure gauge are seen at the left. The lubricating tank oil valves through the round hole near the middle of the front board, with the cylinder lubricating flooding handle below and the magneto grounding switch to right with the accelerating pedal at extreme right. The sliding gear gives four speeds forward, direct on high, and the selective gear shift lever has 5 actions in its 3-slot quadrant. The left pedal releases the clutch, the right pedal applies the counter-shaft brakes through a short evener and the outside hand lever applies the rear wheel brakes through a wire cable loop and its sheave.

drop forging. The wheel-hub and spoke-flange are steel castings, flange 7½ ins. out. dia. The spoke thickness is 2⅛ ins., 12 spokes in each of the four wheels. The steering arms are 8 ins. radius. The I-section front-axle, Krupp chrome nickel steel, is 2½ ins. greatest depth x 2 ins. wide.

SIMPLEX SPRINGS

These are all half-elliptic, front springs under the frame-sides and rear springs outside of frame-sides, usual forms and locations. The rear spring hangers are Krupp, chrome nickel steel forgings. The spring eyes are bushed with soft steel and take ½ in. dia. soft steel bolts; all spring ends fitted with spring oilers.

The front springs are 36 ins. long x 3 ins. wide, 8 leaves, graded thickness, 3-16 to 5-16, side positions of leaves retained by lips. The front springs are perched in the middle.

The rear springs are 54 ins. long x 2¼ ins. wide, 12 leaves, graded 3-16 to 5-16 thickness, lipped, and perched in the middle. All of the Simplex springs have bolts in the middle and are held on their perches with two V-clips, two nuts each, usual form.

THE FRAME

The chassis frame is 175 ins. spring-eye to spring-eye centers. The chassis frame is two widths, 31½ ins. front, 34 ins. rear. The side frame bend is very long and is not reinforced in any way whatever. The counter-shaft brackets are fixed to the frame sides with no adjustment and the counter-shaft bearings are not globed and have no adjustments. The two counter-shaft brake-drums are applied to extensions of the balance-gear drum. All the component assemblies are in dust-proof casings and the whole underside of the chassis back to the rear end of the gear-box is protected by a sheet-steel pan.

THE MOTOR

The crank shaft is a Krupp, chrome nickel steel forging, 3 bearings, ball bear-

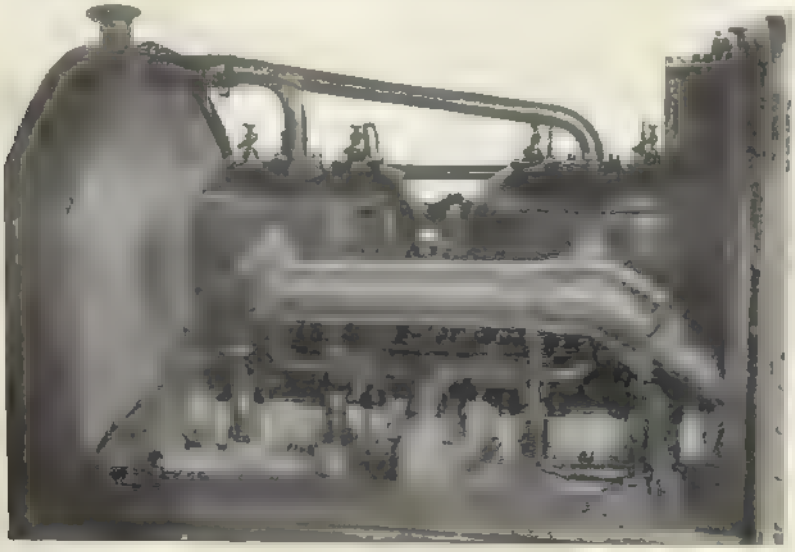


Fig. 5. Simplex 50 H. P. motor, left side. The gray iron exhaust pipe has the screw holes large in the front flange to permit expansion in length. The centrifugal water circulating pump is piped to the cylinders through rubber hose lengths, interposed between the pump T-branch pipe and the cylinder-jacket water pipe heads and a third length of rubber hose is placed between the top water pipe and the radiator.

STEERING POST CONSTRUCTION

The steering action is a worm and worm gear, 1⅛ turns of the 18-in. hand-wheel for the full sweep of the front wheels. There is no adjustment of the worm and worm gear towards each other. The worm and worm gear casing are of manganese bronze. The worm is steel, and the worm gear sector is phosphor bronze. The drop forging steel steering arms have a flange, fixed to the bronze worm gear by 3 bolts, 7-16 dia. and two dowel pins

The principal novelty of this Franquist steering post lies in the spark and throttle lever connections with the control bell cranks at the steering post lower end. The top hand-lever retention is by ratchet segments as usual, but the hubs of both the spark and throttle levers are quick-pitch, quadruple-thread screws, both left hand, tapped into the hand-wheel hub, everything revolving with the hand wheel, the spark lever hub being a sleeve to let the throttle lever shaft pass through it, so that

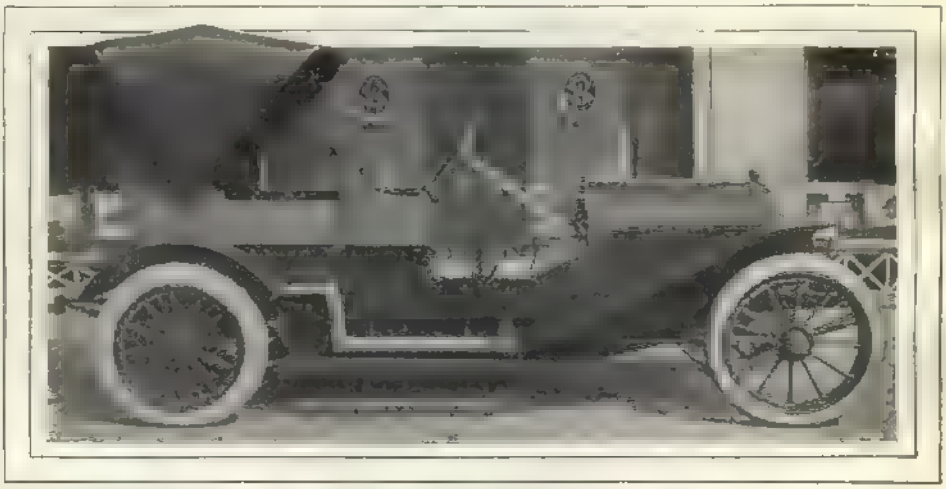


Fig 2. Stoddard-Dayton 1912 90 H. P. [illegible] Seats four passengers. Wheel base, 134 inches, gauge, 56 inches. [illegible] front [illegible] rear [illegible] 6 [illegible] 98 H. P. at 800 R. P. M. [illegible] 900 [illegible] to 540 turns of driving wheels. Weight [illegible] 5,500 lbs. [illegible] straight away good roads speed [illegible] miles per hour. Price $5750 [illegible] except [illegible] top, which is fitted to order only. 90 H. P. limousine, $6850.

one screw stands below the other in the hand wheel hub. The rise and fall of each hand-lever hub screw is transferred to the lower bell-cranks through a steel rod of only ⅛ in. diameter, these long ⅛ rods being so flexible as not to be affected by the steering wheel rotation, giving a simple flexible-rod connection and avoiding all construction complications permitting the hand-levers to revolve with the hand wheel, greatly to the convenience of the driver, whose hands are always in the same relative position with respect to the spark and throttle control levers.

THE BRAKES

The ordinary brakes pedal applied are on the counter shaft and have cast steel drums 10⅝ dia. x 3 ins. face; the emergency brake-shoes are in internal, pressed steel, rear wheel hub drums, 14¼ dia. x 2 ins. face, grey iron shoes. In each brake system one brake application is the abutment for the other, ensuring absolute equality of brake-retardation, as all brakes are run dry. The rear brake equalization is by wire cable, the counter shaft brake equalization is by a short evener.

The clutch is 67 discs, bronze and steel alternated in an oil tight casing.

Ignition is single, jump spark plugs and Bosch high tension magneto.

The water circulation is by a centrifugal pump, gear-driven, even turns with the crank shaft. No fan is fitted, save the fly wheel arms.

The lubrication is from an elevated, lubricating oil reservoir, containing a mechanically operated force pump which forces a measured quantity of oil per crank shaft turn through an unobstructed oil lead to each lubrication point, no oil return to reservoir.

THE AXLES

These are Krupp chrome nickel steel drop forgings, ample I-section, no weld. The front axle ends are single eyes, not forked, with pins to give top and bottom support to the forked stub-axle lugs. The front wheels are carried on two circles of 9-16 balls in D. W. F. annular bearings, 1¾ ins. large ball bearing seat dia. The ball circles are 4 1-16 ins. c. to c. The stub axle hub is forked, top and bottom members, each having a bronze bushed vertical pin-eye, and a horizontal steering arm oblong seat. The axle eye is 1¾ deep and the pin, chrome nickel steel, is hardened and ground, about 1 3-16 dia. x 5 ins. long, pinned to the axle eye in the middle. The stub axle is a Krupp, chrome nickel steel

horizontally sliding sleeve-throttle, T, which is shown as standing at extreme open position and is moved to the right by means of the throttle bell-crank, B, and the hand-wheel lever connected at B-1, or by the accelerator pedal spring connected at B-2, to close the annular opening between the sliding throttle and the stationary throttle sleeve head, H. The sliding throttle, T, may be moved to any intermediate position between closed and full-open by the steering-wheel hand-lever, and may then be moved to full open by accelerator pedal depression, and will return to hand-lever-controlled position when the accelerator pedal is released, all in the usual manner. The annular throttle port opens to the wedge-shaped lower end of the motor supply pipe.

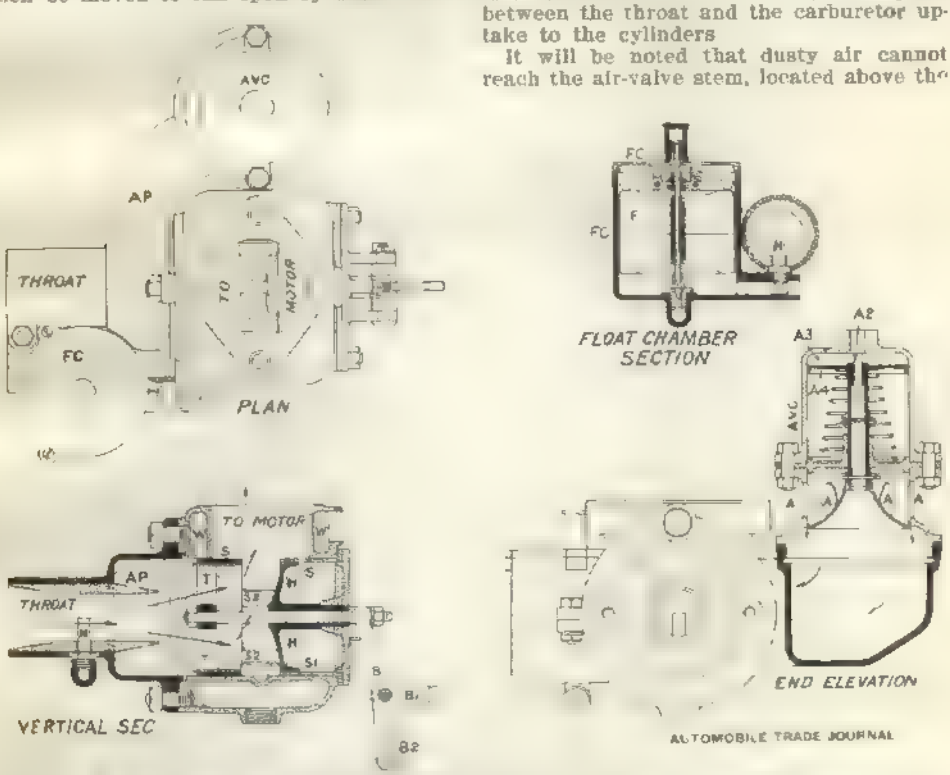
S-1, S-1, are two of the four ribs, which connect the two members, S, left and S-1, right, of the throttle sleeve, so as to leave an annular throttle sleeve port to the motor intake passage, coacting with the throttle, all as shown in the vertical section. The uptake to the motor and the throttle sleeve are warmed by the hot water passages W, W, W, which take hot water from one of the cylinder jackets and deliver it through a drain pipe to the centrifugal circulating pump.

The automatic air valve, A-1, end view, is open through the ports, A, A, A, A, to the atmosphere equally on all sides. A-1 is guided at the bottom in the bulk-head and at the top end by the pin A-2, reaching downward through the dash pot A-3, with which the slack-fitted piston, A-4, integral with the hollow air-valve stem, coacts to prevent air valve fluttering or shattering.

When the motor runs rapidly, the increase of piston suction pulls the air valve, A-1, downward, thus admitting air through A P to the throttle valve T, at a point between the throat and the carburetor uptake to the cylinders

It will be noted that dusty air cannot reach the air-valve stem, located above the air-valve ports. This is important as the automatic air-valve must be delicately responsive to slight varieties in piston suction effect and hence would not bear the increased resistance to sliding movement caused by the presence of dust in the valve stem guides.

Each component assembly of this elaborate Simplex carburetor can be removed by taking out two screws and is of such construction as to be readily disassembled so as to permit complete inspection and cleaning.




A, automatic air valveintake ports. A1 automatic air val... air valve top ... throttle bell crank, B1, hand ... throttle sleeve. ... between S ... water jacket, A', automa... valve air port to throttle ... casing

THE CENTRIFUGAL WATER PUMP

The objects sought in the pump design are ready disassembling and the convenient arrangement of parts, with direct circulation of water.

C is an internal solid jaw coupling, per-

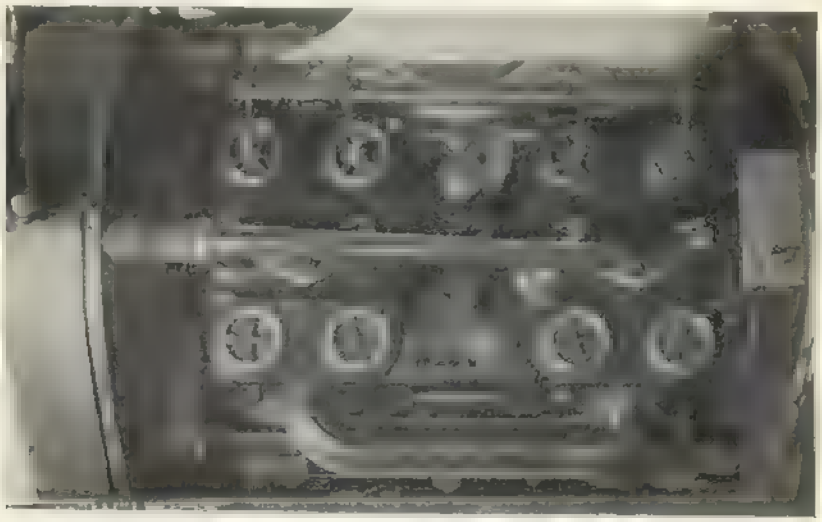
ing in front, bearings and wrists all 2 ins. dia., wrists all 3¾ ins. long, intermediate and rear bearings each 4½ ins. long. The middle crank-arms are 1 3-16 x 2¾ section, while the second and fourth arms, double length, are 2¾ x 2¾ with a 2¼ dia. hole straight through. The cylinders, dual units, 5¾ x 5¾ are 6¾ ins. center to center.

The cam-shaft and cams are integral, open-hearth-steel round-bar stock, first roughed out, then carbonized and then finished to shaft-diameter, then hardened, leaving the shaft portion soft, next turned up on centers and, finally, a trueing cut is taken over the cylindrical shaft portions. The cams are finished to form and size before carbonizing and are not ground to final form. The cylinders are bored on a Smith and Beaman, 2-spindle boring-machine and finished by grinding on a Heald machine

A second important feature of this Simplex, disc-clutch construction is found in the ball bearing support of the pedal-rocker trunnion-collar on the line-shaft which supports the otherwise free inner pedal rocker journal, the annular bearing being retained in fore and aft position by a strut from the inside rock-shaft journal box to the front end of the sliding gear box. This makes the inner bearing of the pedal rocker "floating," so that it always keeps its exactly correct position in relation to the line shaft and annular bearing, giving the possibility of the very delicate adjusted gradual engagement and slipping engagement of the clutch which is now well known to be a highly important requirement.

THE SIMPLEX CARBURETOR

This carburetor is so designed that dust cannot affect the action of the automatic, air-intake valve, which carries a disc on



The Simplex motor, showing water piping, etc., of cylinders and the wiring casing. The ignition is by [illegible] magneto and dual spark plugs only. The [illegible] is shown close up under the hood on the front side of the foot board. The valve cages are made thick enough to [illegible] and are threaded into the cylinders, d p. 1. The cylinders have cocks on top

The pistons are 2 cylinders in form, 1-32 under cylinder-bore at the top, 5.735 at the piston pins and lower end. The piston packing is 4 rings, all above the pins, 45 deg. angle cut, rings free in piston grooves. Drawn brass cups, bottoms pierced to permit rod-swing, are placed to shield the pistons and cylinders from overabundant splash-lubrication.

THE CLUTCH.

The clutch is of the multitple disc type having 67 discs. The notable feature of this clutch construction is that the line shaft has the clutch teeth at the front end, so that the whole clutch can be assembled from the front, and the female clutch member is supported close to the fly wheel bearing, thus ensuring line shaft and fly wheel concentricity under all conditions of wear. The usual construction places the line shaft clutch at the rear end, where slight wear leads to eccentricity.

its upper end, slack fit in the spring-casing with which the disc or piston coacts to prevent fluttering of the air-valve by a dash-pot and piston effect.

The wedge form of the lower end of the up-take pipe to the cylinders gives a restricted area to the low point of mixture entrance which increases the range of motor power by making the closely throttled charge effective

CARBURETOR FUNCTIONAL DESCRIPTION

The float chamber has a float opened and closed gasoline needle valve, ordinary construction, as shown in Fig. 7 "Float Chamber Section," admitting gasoline to the vertical gasoline stand-pipe and nozzle, 1-16 above gasoline level in float chamber, which stands cross-wise of the throat, about 1¼ ins. smallest diameter, as shown in the "Vertical Section."

From the throat the mixture passes the automatic air ports, A P, goes through the

Fig. 10. Front of Simplex 50 H. P. chassis, showing the dropped front cross member which supports the radiator on ¼ inch thickness of rubber packing. The compression relief push rod handle is concealed by the left-hand side frame. The lamp brackets, steel drop forgings, are bolted to the outsides of the chassis frames.

coacting spring plungers, P4, P5, P6, which are spring forced to shoulder seats towards the plungers P1, P2, P3. The lengths of P1, P2, P3, may be such as to leave varying spaces between the coacting plunger ends, and, since the plungers are all submerged, the varying spaces will be filled with oil. The oil pressure in the pressure duct, P D, forces the piston plungers, P1, P2, P3, towards their coacting opposed spring plungers P4, P5, P6, thus forcing the oil between the opposed plungers into the crank-box oil leads. The plunger areas and spring-pull and load are so proportioned that if the crank-box oil-leads are obstructed at the delivery ends the oil-lead pressure will rise to about 70 lbs. per square inch, but if this pressure does not free the oil-lead, then the spring of the safety valve, S V, will yield, and no damage to the oiling system will result.

The pressure duct, P D, may at any time be opened by means of a flooding delivery cock, to the piston oil-groves by the hand of the driver without interfering with the normal supply of oil to the three crank shaft bearings and thence to the crank-pit oil pools.

Since the working stroke of the primary oil-plunger, Y P, is made by spring-pull, the pressure in the pressure duct, P D, must be constant irrespective of motor-speed, and since Y P is positively moved to the left once for every 150 crank shaft revolutions the crank-box oil leads must receive a variable fixed quantity of oil for each revolution of the crank shaft.

This oiler operation is not affected by small particles of dirt, hence the strainer makes the oil supply certain so long as the oil-reservoir level is high enough to submerge the plungers, which are horizontal and placed low in the reservoir.

It will be seen by the reader who has followed this description intelligently, that the action of this Franquist oiler is ideal, giving a fixed variable quantity of oil to each oil-lead for each crank shaft revolution, oil-leads wholly unobstructed, and that in addition a heavy oil-lead pressure is applied when needed to force an exit, while the driver can flood the pistons, piston pins and cylinders with oil under heavy pressure at will

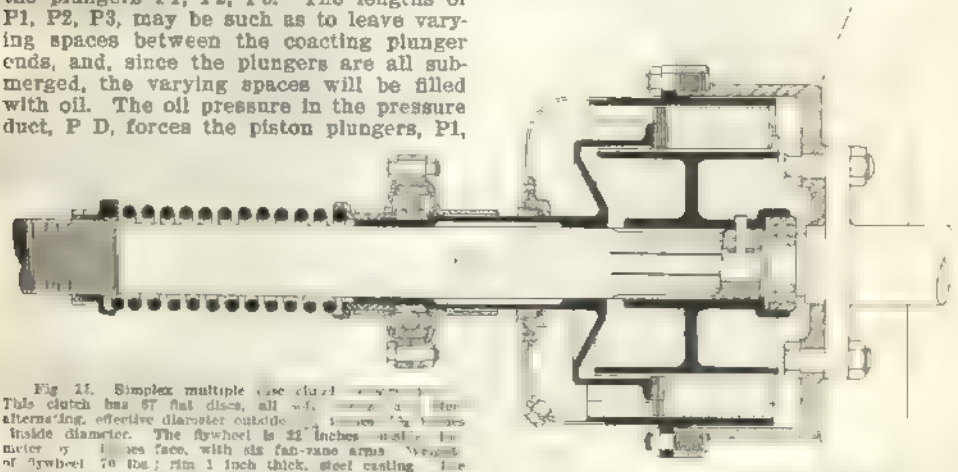


Fig. 11. Simplex multiple [illegible] This clutch has 67 flat discs, all [illegible] alternating, effective diameter outside [illegible] inside diameter. The flywheel is 21 inches [illegible] meter by [illegible] face, with six fan-vane arms [illegible] of flywheel 70 lbs.; rim 1 inch thick, steel casting. The [illegible] disc has six [illegible] 6 inch wide. The total length of disc space is [illegible] lbs. The discs [illegible] oil tight casing and the whole [illegible] in the usual manner and then clipped into the flywheel casing and held by six studs and nuts.

SIMPLEX CONTROL.

The outside hand lever, latched, is pulled backward to apply the rear hub brakes, and is not interlinked to first disengage the clutch. The inside hand lever shifts the change gear, and has 5 positions in 3 slots.

The left hand pedal disengages the multiple-disc clutch. The right hand pedal applies the counter shaft brakes. The horizontal accelerator pedal is placed at the extreme right of the toe-board. The plunger-pedal muffler cut-out is midway between the two large upright pedals.

ON THE ROAD.

Wednesday, January 13, a Simplex 50 H. P. chassis, fitted with two seats in front and carrying a box with two or three

mitting the ready removal and replacement of the pump when the stuffing box, S B, is clacked off

THE SIMPLEX MECHANICAL OILER.

This oiler, Franquist design, patent pending, supplies any required number of oil-leads with variable quantities of lubricating oil under considerable pressure and also gives a flooded emergency oiling to the pistons, piston-pins and cylinders at the driver's discretion, all with obstruction of oil-leads, the oil lead pressure being used to clear the discharging end of the oil-lead from accidental obstructions, and is different in its method of action to any other mechanical oiler known to the writer

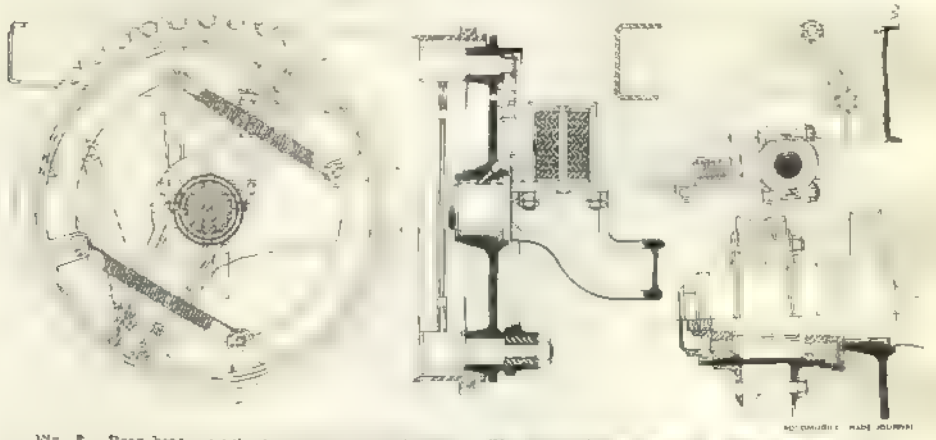


Fig 8. Rear brake [illegible] inches face, pressed steel. The [illegible] worked with no lubrication. The [illegible] shoes [illegible] springs which hold the shoes free of the drum when not in work. The [illegible] Cast iron guard eyes tapped into [illegible] rear wheels are on Hess Bright annular bearings, 9 16 [illegible] 4 inches c. to c. of [illegible] axial bearing [illegible] Diameter 1⅝ inches. The rear axle is a Krupp [illegible] nickel steel drop forging, [illegible] by 1¾ inches with ⅝ web thickness. The strut front [illegible] eye is split, rabbeted and [illegible] hex nuts, castellated, with split pins. The brake [illegible] cam cover is integral with the [illegible] Krupp forging, very large and substantial at all points.

The Simplex motor connecting rods, pistons and cylinders are normally splash oiled from four crank-pits splash-pools, small holes in the oil-basin partitions permitting splash-pool level equalization, the four splash-pools being supplied with oil by three oil-leads, one to each of the three crank shaft bearings, the drip going to replenish the splash-pools, and each bearing receiving a measured quantity of oil for each crank shaft revolution, this variable quantity being constant at all speeds.

THE OILER.

Besides this constant supply of oil to the three crank shaft bearings the driver may at will open a hand-cock which delivers a large supply of oil under heavy pressure to piston oiling groves in the plane of the piston-pins axis, the piston grooves registering with the oil-lead openings when the piston is at low point.

Franquist's scheme is to fill an oil-pressure duct by a spring-driven oil force-pump plunger, and to apply the pressure in this pressure-duct to a series of secondary oil-plungers coacting with an equal number of opposed spring-plungers or pistons to force a variable quantity of measured oil into each of the three, unobstructed, crank-box oil-leads. The oil forced by the primary plunger into the pressure duct may be delivered to the piston oil-grooves at the will of the driver, thus providing an emergency oiling system for the pistons, cylinders and connecting rods independent of the splash.

Referring to Fig. 14, Y P is positively moved to the left once for every 150 revolutions of the crank shaft, and is then free to be pulled to the right by the spring, Y P S. The plunger Y P, discharges oil

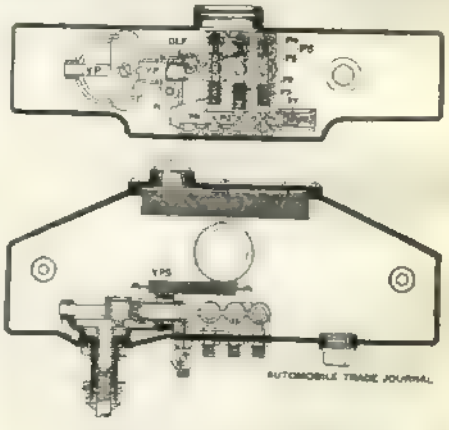



Fig 9. Sectional view of the new Simplex oiler. This mechanical oiler has several peculiar features described fully in the text under "The Oiler." It will produce a [illegible] of as high as 70 pounds to the square inch in case the pipes are obstructed and by turning a small hand lever the driver can turn an extra quantity of oil to the pistons, connecting rods, etc. independent of the splash

at constant pressure, irrespective of motor speed, into the pressure duct, P D, open to the piston plungers, P1, P2, P3, spring forced to shoulder seats away from their

hundred pounds of iron in the rear seat location, driven by William Watson, with the writer in the left front seat as observer, left the Simplex factory, 83d Street and the East River, New York City, at 8 A. M bound for Babylon, Long Island, via 34th Street Ferry to Long Island City, Flushing and Amityville, return by way of Flushing and 92nd Street Ferry, 100 miles or more round trip

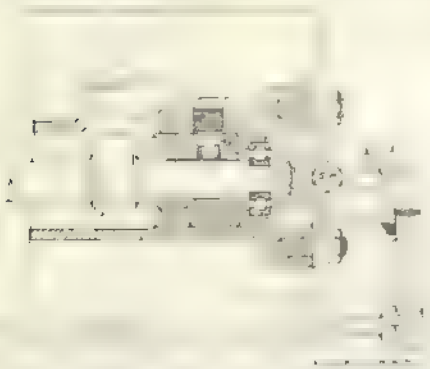


Fig 12. The compression is 90 pounds, too much to crank easily with 5¾ inch piston diameter, hence a compression release is fitted. Each exhaust cam has an integral [illegible] approached by an incline in front of the cam roller path for [illegible] compression, and the cam shaft rear end takes the [illegible] of an annular ball bearing, the connecting rod cap being fixed by the open end [illegible] slider having two V grooves which contact with the spring plunger S F, and so that the cam shaft can be given two absolutely invariable fore and aft positions, V-groove and spring plunger retained, the forward cam shaft position giving 90 pounds full charge compression while the rear position of the cam shaft brings the compression release cam into the cam roller path and holds the exhaust open during the first part of the piston compression stroke. The cam shaft is moved by a push-and-pull hand rod and its co-acting lever, both forward and backward.

The day was cold and clear, with an 8-mile breeze from the northeast stinging our faces at first though not distressing after we became accustomed to it, but the seats were sheet-steel buckets, with no hand holds at all anywhere, except the thin, front edges of the seats themselves, while the partial toe-board gave a foothold in one rider's position only, with the feet so high as to prevent leaning forward low enough to take the wind of a 70-mile clip with any comfort whatever. These bucket seats were not upholstered. The driver's seat had a regulation cushion, but the observer rode on a bag of feathers, and made up his mind very early in this most uncomfortable run of his experience that he would do well if he kept his seat through the speedy adventure. The Simplex factory is turning out a new chassis every two or three days and they are all tried out by Watson on Long Island, east of Jamaica and Huntington, where the roads have no speed limit during week days. The particular Simplex chassis of this occasion had previously been driven for three days, perhaps 350 or 400 miles in all, and therefore was handled with perfect confidence by Watson, but who had been told the night before that the observer was not afraid of fast riding and that the run was intended to show what the Simplex 50 could do on the road.

From the factory the chassis was driven first to the Yorkville Garage, 86th Street near 3rd Avenue, where the gasoline tank was filled full, it being the observer's intention to have the chassis weighed as it stood with its passengers that day, and to note the quantity of gasoline required to fill the tank at the end of the run, but these things were not done as the motor ran through all of our long stops.

From the Yorkville Garage the chassis was driven to 34th Street Ferry and from Long Island City to Jamaica, legal rate 20 miles after leaving Long Island City. As much of this road was very rough, our pace was not much over 30 miles anywhere, but the cold wind chilled the observer and a long stop for warming was made at Jamaica. Leaving Jamaica on the Merrick Road, which was fairly smooth all the way to Babylon, something like 34 miles, Watson began to push the Simplex with the muffler cut-out open, the observer trying in vain to assume a crouch which would mitigate the stress of the 80 miles' wind and finally calling a dead stop and trying to find a position and hand-hold which would make him feel secure in his seat, with no satisfactory result. There were many teams on the road, but in spite of our speed Watson kept the Simplex far away from all other vehicles, and we reached Babylon, 34 miles from Jamaica, in about 38 minutes total elapsed time, our highest speed being, probably, something over 70 miles.

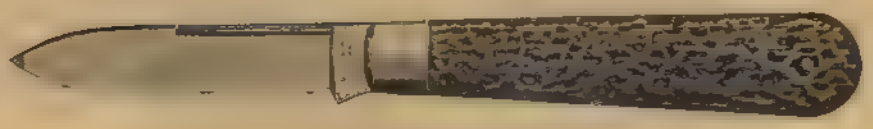
At Babylon a stop of some length was made for warming, and the observer took a good look at the Simplex seat and toe-board, but could see no better change than that to place the feather cushion at his back instead of sitting on it when the return start was made. Watson drove hard going back and the observer again called for a stop and finally placed the feather cushion at his back and left side and avoided the wind by leaning far to the rear and left as Watson hurried the car back to Jamaica in about 34 minutes total elapsed time for the 34 miles from Babylon, including the full stop at the observer's request and many slow-downs in meeting and passing teams. At Jamaica, closed railway gates held us for 5 minutes or so, and we then jogged to Flushing, where our third stop for warming was made, after which we ran slowly to 92nd Street Ferry where we again had a wait of some minutes, finally reaching the Simplex factory, 83d Street and East River, at 12 15 P. M., the observer being very glad indeed to find himself safely inside the factory walls.

There are some little hills between Long Island City and Jamaica, but all smooth road surface was taken on high gear and at any desired pace, the second speed being used only for two or three stretches of very rough going.

The Simplex 50 can do 80 miles easily on a smooth, clear road, and was under perfect control at all times, the brake resistance being ample for any speed and working with the utmost smoothness

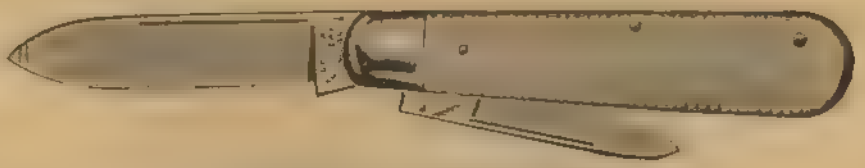
# Pocket Knives

## VOLKA



One Blade, Iron Lined

| No. | | Per Doz |
|---|---|---|
| 10025–2¼in. | Black Japanned Iron Handle | $ 0.80 |



Two Blade, Iron Lined, Iron Bolster

| No. | | Per Doz. |
|---|---|---|
| 20073 | 2⅞ in White Bone Handle | $ 2.00 |

Two Blade, Iron Lined and Iron Bolster, Brass Shield

| No. | | Per Doz |
|---|---|---|
| 20118–3½ in. | Stag Handle | $ 3 50 |

Two Blade, Iron Lined and Iron Bolster, Brass Shield

| No. | | Per Doz |
|---|---|---|
| 20110–3¼ in. | Ebony Handle | $ 3.50 |

Two Blade, Iron Lined and Iron Bolster, Brass Shield

| No. | | Per Doz |
|---|---|---|
| 20131–3½ in. | Cocoa Handle | $ 3 50 |
| 20133–3½ in. | White Bone Handle | 3 50 |
| 20138–3½ in | Stag Handle | 3.50 |

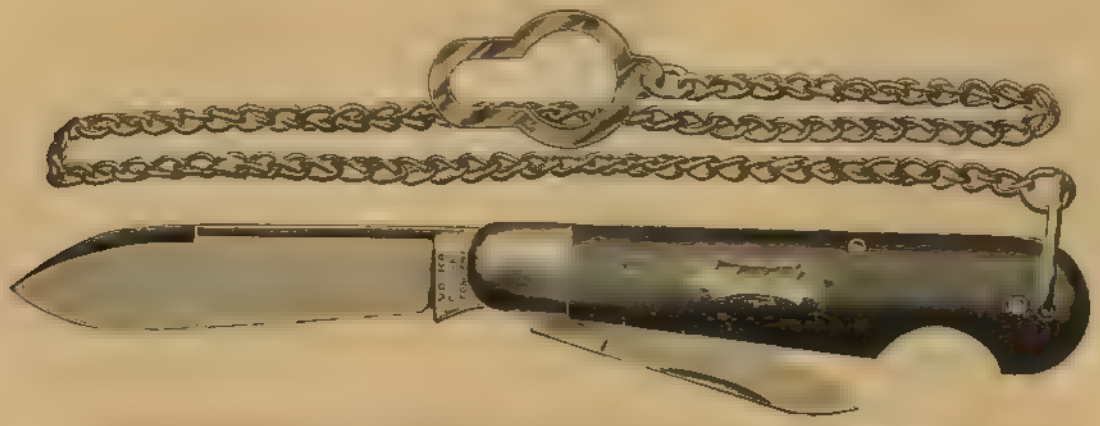
Full Size Cuts One-half Doz in a Box

# Pocket Knives

## VOLKA

Easy Opener, Two Blade, Iron Lined and Iron Bolster, Brass Shield

| No. | | Per Doz. |
|---|---|---|
| 20153–3½ in. | White Bone Handle | $ 3.50 |
| 20158–3½ in. | Stag Handle | 3.50 |



Easy Opener With Chain, Two Blade, Iron Lined and Iron Bolster, Brass Shield

| No. | | Per Doz. |
|---|---|---|
| 20160–3½ in. | Ebony Handle | $ 3.50 |
| 20168–3½ in. | Stag Handle | 3.50 |

Two Blade, Iron Lined, Iron Bolster, Brass Shield

| No. | | Per Doz. |
|---|---|---|
| 20180–3½ in. | Ebony Handle | $ 3.50 |

Two Blade, Full Crocus Polished, Iron Lined, German Silver Shield

| No. | | Per Doz. |
|---|---|---|
| 20223–3 in. | Stag Handle | $ 4.00 |

Full Size Cuts One Half Size in a Box

# Pocket Knives

## VOLKA

Two Blade, Full Crocus Polished, Iron Lined, German Silver Shield

| No. | | Per Doz. |
|---|---|---|
| 20234½ 3⅛ in. | Horn Handle, Inlaid | $ 4 00 |
| 20238 -3⅛ in. | Stag Handle | 4.00 |

Two Blade, Full Crocus Polished, Brass Lined

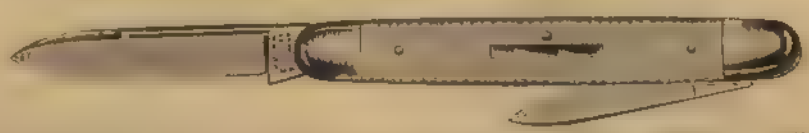
| No. | | Per Doz. |
|---|---|---|
| 20254-3⅛ in. | Horn Handle | $ 4 00 |
| 20258-3⅛ in. | Stag Handle | 4 00 |

Two Blade, Half Crocus Polished, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz. |
|---|---|---|
| 20273-2⅛ in. | White Bone Handle | $ 4.00 |
| 20278-2⅛ in. | Stag Handle | 4 00 |

Two Blade, Half Crocus Polished, Brass Lined, German Silver Tips and Shield

| No. | | Per Doz. |
|---|---|---|
| 20283-2⅛ in. | White Bone Handle | $ 4.00 |
| 20288-2⅛ in. | Stag Handle | 4.00 |



Two Blade, Half Crocus Polished, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz. |
|---|---|---|
| 20293-3 in. | White Bone Handle | $ 4 00 |
| 20298-3 in. | Stag Handle | 4.00 |

Two Blade, Half Crocus Polished, Brass Lined, German Silver Tips and Shield

| No. | | Per Doz. |
|---|---|---|
| 20303-3 in. | White Bone Handle | $ 4.00 |
| 20308-3 in. | Stag Handle | 4.00 |

Full Size Cuts on Real Size in a Box

# Pocket Knives

## VOLKA

Two Blade, Glazed Finish, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz |
|---|---|---|
| 20323–3½ in. | White Bone Handle | $ 4.00 |
| 20328–3½ in. | Stag Handle | 4.00 |

Two Blade, Half Crocus Polished, Brass Lined, German Silver Tips and Shield

| No. | | Per Doz |
|---|---|---|
| 20344½–3¼ in. | Horn Handle, Inlaid | $ 4.00 |

Two Blade, Glazed Finish, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz |
|---|---|---|
| 20360–3¼ in. | Ebony Handle | $ 4.00 |
| 20363–3¼ in. | White Bone Handle | 4.00 |
| 20368–3¼ in. | Stag Handle | 4.00 |

Two Blade, Full Crocus Polished, Brass Lined, German Silver Bolster, Cap and Shield

| No. | | Per Doz |
|---|---|---|
| 20404–4 in. | Horn Handle | $10 00 |
| 20408–4 in. | Stag Handle | 10.00 |

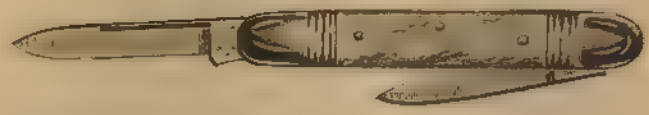
Two Blade, Glazed Finish, German Silver Lined, German Silver Bolsters

| No | | Per Doz |
|---|---|---|
| 26209–2¼ in. | Pearl Handle | $ 8.00 |

Full Size Cuts One-half Doz n a Box

# Pocket Knives

## VOLKA



Two Blade, Full Crocus Polished, German Silver Lined and Bolsters

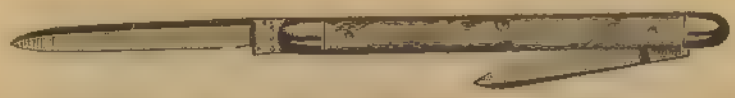
| No. | | Per Doz. |
|---|---|---|
| 26219–2¼ in. | Pearl Handle | $ 4 00 |

Two Blade, Full Crocus Polished, German Silver Lined, German Silver Bolsters

| No. | | Per Doz. |
|---|---|---|
| 26239–2⅜ in. | Pearl Handle | $ 4.00 |

Two Blade, Full Crocus Polished, Brass Lined, German Silver Tips

| No. | | Per Doz. |
|---|---|---|
| 26249–2½ in. | Pearl Handle | $ 8 00 |



Two Blade, Full Crocus Polished, German Silver Lined, German Silver Bolsters

| No. | | Per Doz. |
|---|---|---|
| 26279–2½ in. | Pearl Handle | $ 8.00 |

Two Blade, Full Crocus Polished, Brass Lined, German Silver Bolsters

| No. | | Per Doz. |
|---|---|---|
| 26299–3 in. | Pearl Handle | $ 8 00 |

Three Blade, Half Crocus Polished, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz |
|---|---|---|
| 30103–3⅛ in. | White Bone Handle | $ 8.00 |
| 30108–3⅛ in. | Stag Handle | 8.00 |
| 30109–3⅛ in. | Pearl Handle | 18 00 |

Full Size Cuts, One-half Doz. in a Box

# Pocket Knives

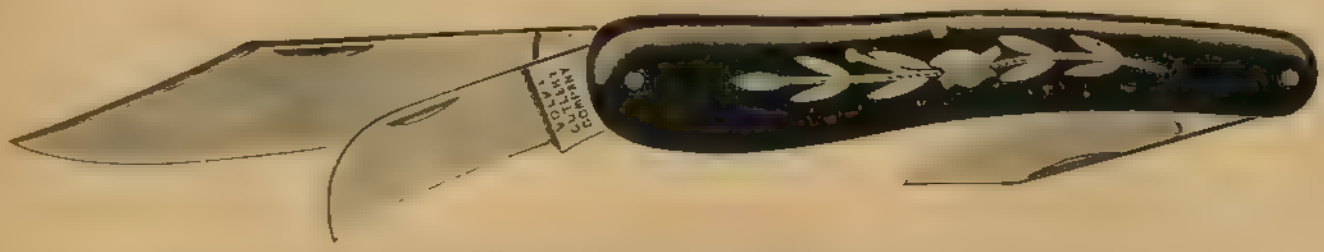
## VOLKA

Three Blade, Half Crocus Polished, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz. |
|---|---|---|
| 30118–3¼ in. | Stag Handle | $ 8.00 |

Three Blade, Glazed Finish, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz. |
|---|---|---|
| 30128–4 in. | Stag Handle | $ 8.00 |



Three Blade, Full Crocus Polished, Brass Lined

| No. | | Per Doz. |
|---|---|---|
| 30144½–4 in. | Horn Handle, Inlaid | $10.00 |
| 30148 –4 in. | Stag Handle | 10.00 |

Three Blade, Half Crocus Polished, Brass Lined, German Silver Bolsters and Shield

| No | | Per Doz |
|---|---|---|
| 30154–3¼ in. | Horn Handle | $10.00 |
| 30158–3¼ in. | Stag Handle | 10.00 |

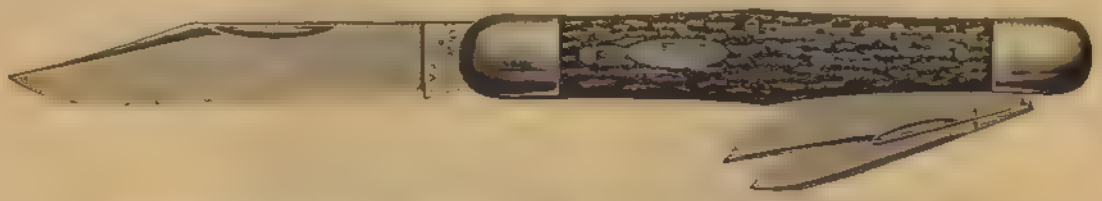
Full Size Cuts, One half Doz. in a Box

# Pocket Knives

## VOLKA

Three Blade, Crocus Polished, Brass Lined, German Silver Tips and Shield

| No. | | Per Doz. |
|---|---|---|
| 30163–3¼ in. | White Bone Handle | $ 8 00 |
| 30164–3¼ in. | Horn Handle | 8 00 |
| 30168–3¼ in. | Stag Handle | 8.00 |



Three Blade, Half Crocus Polished, Brass Lined, German Silver Bolsters and Shield

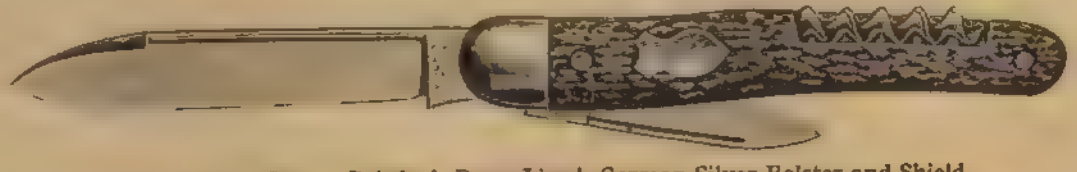
| No | | Per Doz. |
|---|---|---|
| 30173–3⅛ in. | White Bone Handle | $ 8.00 |
| 30178–3⅛ in. | Stag Handle | 8.00 |

Three Blade, Half Crocus Polished, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz. |
|---|---|---|
| 30183–3⅛ in. | White Bone Handle | $ 8.00 |
| 30188–3⅛ in. | Stag Handle | 8.00 |

Three Blade, Glazed, Brass Lined, German Silver Bolster and Cap

| No. | | Per Doz. |
|---|---|---|
| 30914–4 in. | Horn Handle | $13.50 |
| 30918–4 in. | Stag Handle | 13.50 |



Three Blade, Crocus Polished, Brass Lined, German Silver Bolster and Shield

| No. | | Per Doz. |
|---|---|---|
| 30924–3⅛ in. | Horn Handle | $10 00 |
| 30928–3⅛ in. | Stag Handle | 10 00 |

Full Size Cuts. One-half Doz. in a Box

# Pocket Knives

## VOLKA

Three Blade, Crocus Polished, German Silver Lined and German Silver Tips

No. — Per Doz.
36209–2⅛ in. Pearl Handle ..... $ 8.00

Three Blade, Crocus Polished, Brass Lined, German Silver Bolsters and Shield

No. — Per Doz.
36239–3 in. Pearl Handle ..... $ 8.00

Three Blade, Crocus Polished, Brass Lined, German Silver Bolsters

No. — Per Doz
36249–2¼ in. Pearl Handle ..... $ 8.00

Three Blade, Crocus Polished, Brass Lined, German Silver Bolsters

No. — Per Doz
36259–2⅜ in. Pearl Handle..... $ 8.00

Three Blade, Crocus Polished, Brass Lined, German Silver Bolsters

No. — Per Doz.
36269–3 in. Pearl Handle..... $ 8.00

Three Blade, Crocus Polished, Brass Lined, German Silver Bolsters and Shield

No. — Per Doz
36279–3 in. Pearl Handle..... $ 8.00

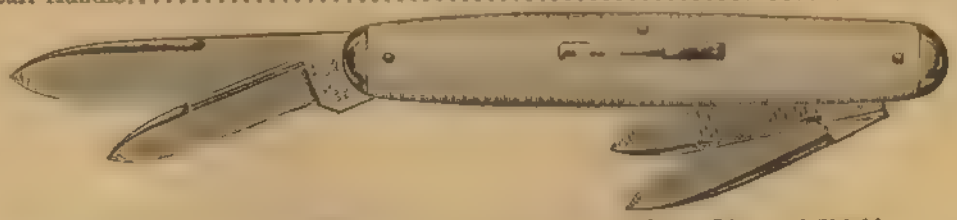
Full Size Cuts. One Half Doz. in a Box

# Pocket Knives

## VOLKA

Three Blade, Glazed Finish, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz. |
|---|---|---|
| 36289-3¼ in. | Pearl Handle | $ 8.00 |



Four Blade, Crocus Polished, Brass Lined, German Silver Tips and Shield

| No. | | Per Doz. |
|---|---|---|
| 40113-3½ in. | White Bone Handle | $ 8.00 |
| 40118-3½ in. | Stag Handle | 8.00 |

Four Blade, Crocus Polished, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz. |
|---|---|---|
| 40123-3 in. | White Bone Handle | $ 8.00 |
| 40128-3 in. | Stag Handle | 8.00 |

Four Blade, Crocus Polished, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz |
|---|---|---|
| 40133-3½ in. | White Bone Handle | $ 8.00 |
| 40134-3½ in. | Horn Handle | 8.00 |
| 40138-3½ in. | Stag Handle | 8.00 |

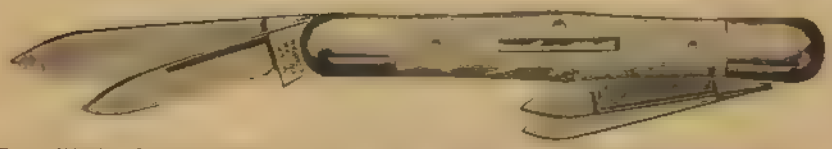
Four Blade, Crocus Polished, Brass Lined, German Silver Shield

| No. | | Per Doz |
|---|---|---|
| 40914-3½ in. | Horn Handle | $12.00 |
| 40918-3½ in. | Stag Handle | 12.00 |

Put Size C 44 One Half Doz in a Box

# Pocket Knives

## VOLKA



Four Blade, Crocus Polished, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz. |
|---|---|---|
| 46209–3 in. | Pearl Handle | $ 8 00 |

Four Blade, Crocus Polished, Brass Lined, German Silver Bolsters and Shield

| No. | | Per Doz. |
|---|---|---|
| 46219–3 in. | Pearl Handle | $ 8.00 |

Full Size Cuts, One-half Dozen in a Box

## MORLEY

| No. | | Per Doz. |
|---|---|---|
| 146 W-Ivoroide | Handle | $ 8 00 |

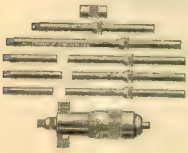
One-half Doz. in a Box

## INSIDE CALIPERS

### L. S. Starrett Co.'s

**Inside Micrometers**

Fig. 403A

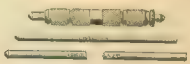


No. 124

Set A has 6 rods and one ½" gauge, and measures from 2 t. 8".
Set B has 10 rods and one ½" gauge, and measures from 2 to 12".
Set C has 4 rods and one 1" and two 2" gauges, and measures from 8 to 32".
Set D comprises sets A and C, and measures from 2 to 32".

**Adjustable Caliper Gage**

Fig. 403B



No. 125

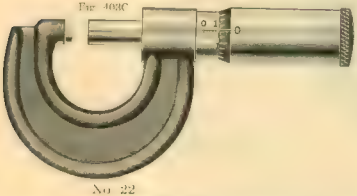
* Designed for internal measurements of large cylinders and for distances between surfaces.

2½" with three rods, capacity from 2½ to 6½" . . . $1.00
6 " with three rods, capacity from 6 to 16" . . . 1.25

The diameter of the steel rod is .150 inch. Extra rods furnished at 2 cents per inch.

### J. T. Slocomb Co's. Micrometer Calipers

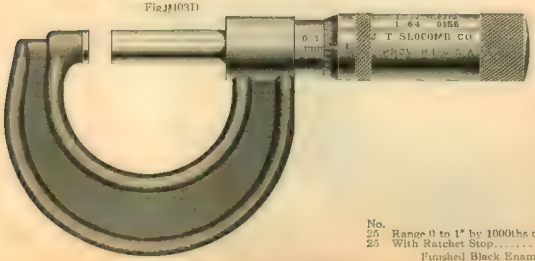
Fig. 403C



No. 22

No.
22 Range 0 to ½" by 1000ths of an inch . . .$3.00

Fig. 403D




No. 25

No.
25 Range 0 to 1" by 1000ths of an inch. . . .$3.50
25 With Ratchet Stop. . . . . 4.00
Finished Black Enamel only

## MICROMETER CALIPERS

Fig. 405A

**Micrometer Set No. 21**

The three tools, a 1-inch, 2-inch, and 3 inch are so arranged as to economize in space. The outside dimensions are 9 ¼ inches x 6¾ inches x 1 ¼ inches.

A good substantial case, covered with real morocco leather and lined with blue plush

Tools and case, complete, $12.00

## CALIPER GAGES AND SQUARES

### L. S. Starrett Co.'s Micrometer Caliper Gages

Fig. 406A

No. 24

This gage is made to fit scales 1¼ in. wide, .085 in. thick, and 12, 18, 24 and 36 in. long affording longer scope than anything of the kind heretofore made. The head of the gage carries auxiliary tram Points. Attachments are also made to slip on and off the ends of the caliper, so that they may be used for making close or drive fits. The inside calipers are set against the inside face of gauge and resting on the seat of the attachments, which keep them in perfect line. The outside calipers are set against an extended seat of the attachment in line with the inside faces of the gauge so that both inside and outside calipers may be set to exactly agree with each other.

For measuring distances, the gauge may not only be set by the graduated scale but varied by the micrometer adjusting nut to read additional thousandths.

| | |
|---|---|
| 12 inch . . . | $11.00 |
| 18 inch . . . | 12.50 |

### Brown & Sharpe's Caliper Square

Fig. 406B

The 4 in., 6 in. and 9 in. Caliper Squares take inside as well as outside measurements.

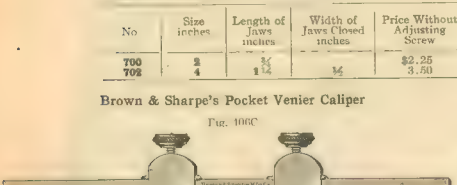
The 6 in. and 9 in. Caliper Squares have hardened jaws.

**Graduations.** These Caliper Squares are graduated on one side to read to 64ths and on the other to 100ths of an inch.

| No | Size inches | Length of Jaws inches | Width of Jaws Closed inches | Price Without Adjusting Screw | Price With Adjusting Screw |
|---|---|---|---|---|---|
| 700 | 2 | ¾ | | $2.25 | $3.50 |
| 702 | 4 | 1¼ | ½ | 3.50 | 4.50 |

### Brown & Sharpe's Pocket Venier Caliper

Fig. 406C



No. 680

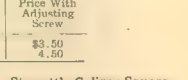
Full Size

This Pocket Vernier Caliper is graduated on the front to read, by means of a vernier, to thousandths of an inch. It is graduated on the back to 64ths of an inch. The jaws are of steel, hardened and ground, are ¾" long, ½" wide when closed and take inside as well as outside measurements. The Caliper measures to 1 11/16 outside diameter

Price, $10.00. In Morocco Case, $10.50.

### Starrett's Caliper Square

Fig. 406D



No. 25

For both outside and inside measure. The beam is graduated in 64ths on one side and 100ths on the other.

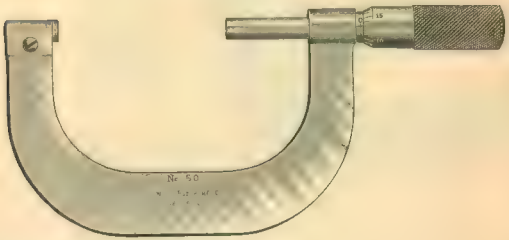
| | |
|---|---|
| A 3", with adjusting screw | $3.50 |
| B 4", with adjusting screw | 4.00 |
| C 6", with adjusting screw | 5.50 |
| D Without adjusting screw | 3.00 |
| E Without adjuting screw | 3.50 |
| F Without adjusting screw | 5.00 |
| With hardened jaws, ex | 1.50 |
| In Leatherette case, extra | .75 |

Sent with adjusting screw and without case unless otherwise ordered

## MICROMETER CALIPERS

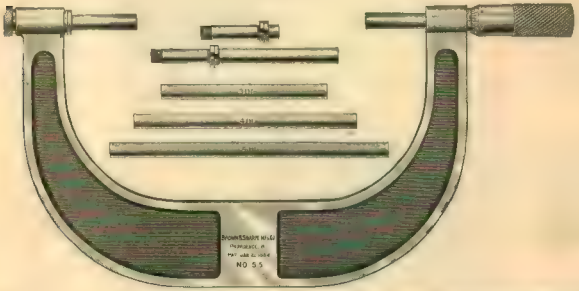
### Brown & Sharpe Mfg,. Co's.

Fig. 397A




| | |
|---|---|
| No. **50** Range 2 to 3 inches, by 1000ths of an inch | $7 00 |
| No. **50** With Ratchet Stop | 7 50 |
| Morocco Case | 1 00 |

Fig. 397B




Range 3 to 6 inches in length, 6 inches character, by 1000ths or an inch, and ¼ 1000ths being easily estimated

| | |
|---|---|
| No. **55** With three anvils, in hardwood case, | $10 00 |
| No. **55** With Ratchet Stop | 10 50 |
| Set of three standards, extra | 4 00 |

## CASES FOR MICROMETERS

Fig. 402A

No. 226
Case for Set of Three

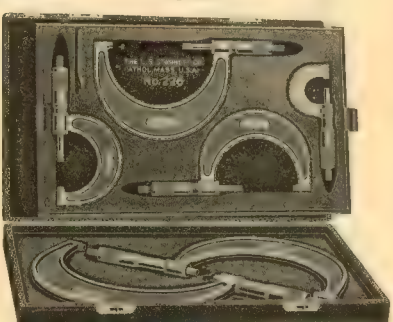
The cases for these micrometers are well made and nicely finished.

They are covered with morocco leather and lined with velvet

Cases only

| | |
|---|---|
| For one inch only, each | $0.50 |
| For set of three Micrometers | 2.00 |
| For sets of six Micrometers | 4.00 |

Fig. 402B




No. 226
Case for Set of Six

### Starrett's Improved Micrometer Stand

Fig. 402C

No. 206

The cut shows the micrometer stand with its improved shaped clamp and tilting bracket, so made that the micrometer with its measuring spindle will stand vertical over the base.

A turn of the wing nut locks both the hinged bracket and the micrometer in position for convenient use. Stands are all nicely finished and nickel plated.

Each, $2 00

### United States Government Micrometer Gauges

Fig. 402D

No. 12

Frames made from steel plate, sides covered with hard rubber

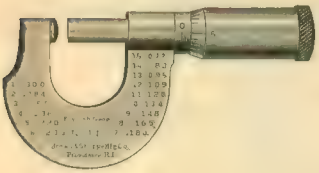
| | | |
|---|---|---|
| 127A | 0 to 1" by .0001ths of an inch | $25 00 |
| 127B | 4 to 5" by .0001ths of an inch | 30 00 |
| 127C | 5 to 6" by .0001ths of an inch | 40 00 |

Furnished in oak case without extra charge.
Prices on larger sizes quoted on application

## MICROMETER CALIPERS

### The Brown and Sharpe Mfg. Co.'s

Fig. 395A

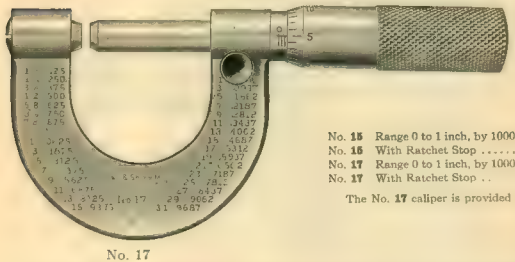


No. 14

### Tubing Caliper

| | | |
|---|---|---|
| No. **14** | Range 0 to ½ inch, by 1000ths of an inch . . . | $4 50 |
| No. **14** | With Ratchet Stop . . . . . | 5 00 |

Fig. 395B



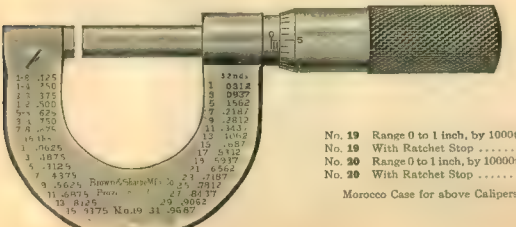
No. 17

| | | |
|---|---|---|
| No. **15** | Range 0 to 1 inch, by 1000ths of an inch . | $5.00 |
| No. **16** | With Ratchet Stop . . . . . | 5.50 |
| No. **17** | Range 0 to 1 inch, by 1000ths of an inch . | 5 50 |
| No. **17** | With Ratchet Stop . . | 6 00 |

The No. **17** caliper is provided with clamp nut.

**Wooden Handle.** No. **17** Caliper is furnished, when desired, with a wooden handle attached to the bow. The handle is about 2¾ inches long. The Clamp Screw is provided with wings instead of a knurled head Price $1.50, in addition to prices given above.

Fig. 395C



No. 19

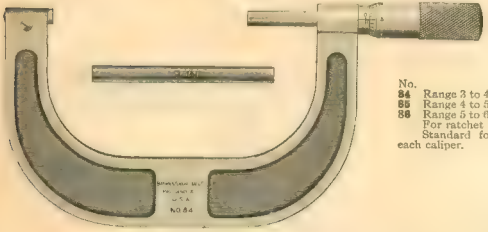
| | | |
|---|---|---|
| No. **19** | Range 0 to 1 inch, by 1000ths of an inch . . . . . | $5 00 |
| No. **19** | With Ratchet Stop . . . . . | 5 50 |
| No. **20** | Range 0 to 1 inch, by 10000ths of an inch . . | 6.00 |
| No. **20** | With Ratchet Stop . . . . . | 6.50 |

Morocco Case for above Calipers, each $0.50.

## MICROMETER CALIPERS

### The Brown and Sharpes Mfg. Co.'s

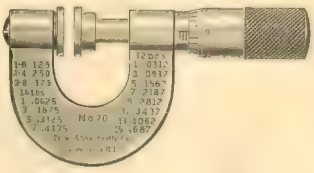
Fig 398A



Nos. 84. 85. 86.

No.
**84** Range 3 to 4″ by 1000ths of an inch $6.50
**85** Range 4 to 5″ by 1000ths of an inch 7.25
**86** Range 5 to 6″ by 1000ths of an inch 8.00
For ratchet stop add $0.50.
Standard for adjusting furnished with each caliper.

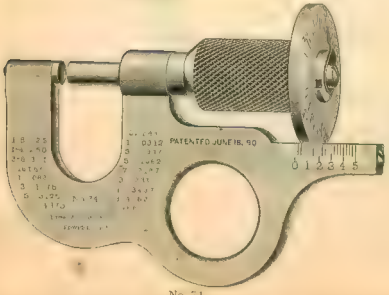
Fig. 398B



No. 70

No.
**78** Paper Gage, range 0 to ¾″ by 1000ths of an inch . . $5.50
**70** With Ratchet Stop. . 6.00
Morocco case, extra .50

Fig. 398C



No. 71

This Micrometer Caliper, shown full size, is recommended as especially convenient for sheet metal workers and handlers.

By placing the middle finger of the right hand through the ring, the Caliper is readily held at right angles to the sheet to be measured and readings made while in this position. The thimble can be operated by the forefinger and thumb of the same hand.

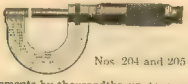
No
**74** Range 0 to ½″ by 1/5 1000ths of an inch, each . . . . . $5.50
Morocco case .50

# MICROMETER CALIPERS

## Starrett's

### Quick Adjusting One Inch Micrometers

Fig. 400A



Nos. 204 and 205

For measurements by thousandths up to one inch. Has ratchet stop and lock nut.

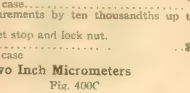
No. 204, each ..... $10.00
In Leatherette case ..... 10.50

For measurements by ten thousandths up to one inch. Has ratchet stop and lock nut.

No. 205, each ..... $11 00
In Leatherette case ..... 11 50

### Two Inch Micrometers

Fig. 400C



. . 2 and 213

For measurement by thousandths from one inch to two inches, with lock nut, ratchet stop, and one inch test gage

No. 2, each ..... $8 50
In Leather case ..... 7 25

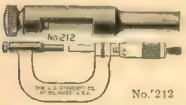
For measurement by ten thousandths from one inch to two inches, with lock nut, ratchet stop and one inch test gage

No. 213 each ..... $7 50
In Leather case ..... 8.25

Both Nos. 2 and 213 sent in case unless otherwise ordered

### Attachment for Two Inch Micrometer

Fig. 400E



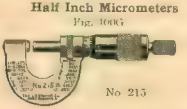

No. 212

This attachment, by means of which a 2 inch micrometer may be instantly converted into a 1 inch tool, will be furnished, when ordered, with any of our 2 inch or 50 millimeter micrometers

Each, $2.00

### Half Inch Micrometers

Fig. 400G



No 215

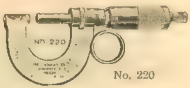
For measurement by thousandths up to one half inch

Has lock nut and ratchet stop.

No. 215 each ..... $5 00
In Leather case ..... 5 50

### Micrometers with Finger Ring

Fig. 400B



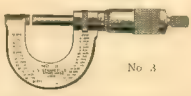

No. 220

220 For measurements by thousandths up to one inch, with lock nut and ratchet stop. $6 75
In Leather case ..... 7 25

221 For measurement by thousandths up to one-half inch, with lock nut and ratchet stop .... 5.75
In Leather case ..... 6.25

### One Inch Micrometers

Fig. 400D



No. 3

For measurement by thousandths up to one inch. Has lock nut and ratchet stop.

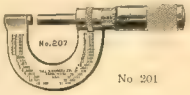
No. 3, each ..... $6.00
In Leather case ..... 6.50

For measurement by ten thousandths up to one inch Has lock nut and ratchet stop.

No. 113, each ..... $7.00
In Leather case. ..... 7.50

### One Inch Micrometers

Fig. 400F




No. 201

For measurement by thousandths up to one inch. Has lock nut but no ratchet stop.

No. 201, each ..... $5 50
In Leather case ..... 6.00

### One Inch Micrometers.

Fig. 400H

No. 202

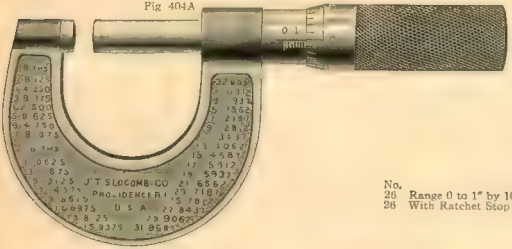
For measurement by thousandths up to one inch. Has ratchet stop but no lock nut.

No. 202 each ..... $5 50
In Leather case ..... 6 00

## MICROMETER CALIPERS

### J. T. Slocomb Co.'s

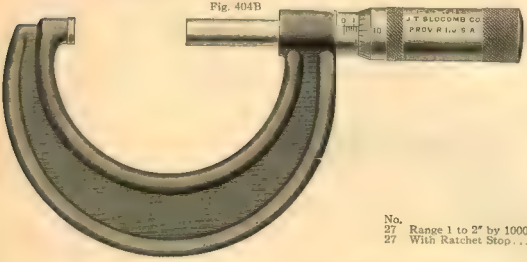
Fig. 404A




No. 26

No. 26 Range 0 to 1" by 1000ths of an inch..$4.50
With Ratchet Stop..... 5.00

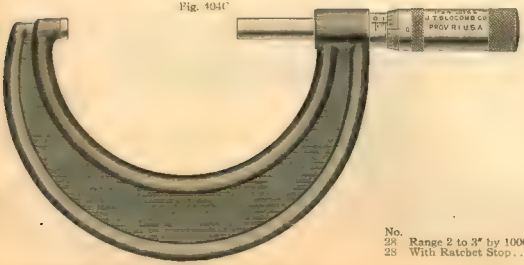
Fig. 404B




No. 27

No. 27 Range 1 to 2" by 1000ths of an inch..$3.50
With Ratchet Stop..... 4.00

Fig. 404C



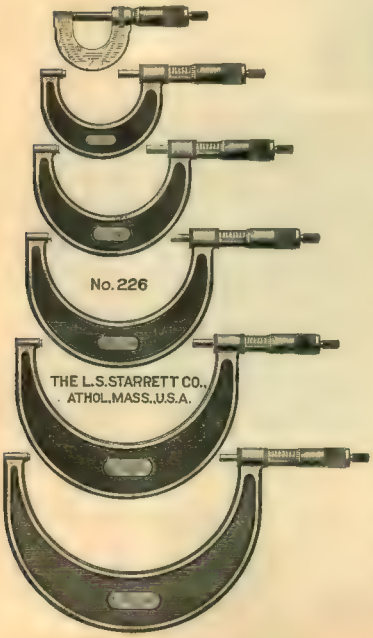

No. 28

No. 28 Range 2 to 3" by 1000ths of an inch..$5.00
With Ratchet Stop..... 5.50

## MICROMETER CALIPERS

### L. S. Starrett Co.'s

Fig. 401A




No. 226 From one to six inches.

### New Micrometers

These micrometers meet the demand for accurate gauges at a low price. They are better adapted for general use than the vernier or bar micrometer, as they can be set quickly for the different measurements and are more easily read.

Each micrometer is graduated to read by thousandths of an inch, is furnished with our patent lock nut, and is sent with or without ratchet stop as desired.

The frames are drop forged from bar steel and are nicely finished.

The 1 inch has the decimal equivalents stamped on the frame. The other sizes are marked to show their capacity.

Standards for use in adjusting these micrometers will be furnished when desired.

Micrometers will be supplied singly or in sets as desired, and will be sent with ratchet stop and without leather case or standard unless otherwise ordered. A reduction is made in the price when sold in sets.

Size

1″ With decimal equivalents stamped on frame, without ratchet stop.....$5 50

1″ With decimal equivalents stamped on frame, with ratchet stop..... 6.00
In case, without ratchet $6.00, with ratchet $6.50

2″ From 1 to 2″, without ratchet stop.... 4.50

2″ From 1 to 2″ with ratchet stop..... 5.00
1 inch standard, $1.00

3″ From 2 to 3″ without ratchet stop 6 00

3″ From 2 to 3″, with ratchet stop 6 50
2 inch standard, $1.00

4″ From 3 to 4″, without ratchet stop 6.50

4″ From 3 to 4″, with ratchet stop. 7 00
3 inch standard, $1.15

5″ From 4 to 5″, without ratchet stop 7 25

5″ From 4 to 5″, with ratchet stop 7 75
4 inch standard, $1.35

6″ From 5 to 6″, without ratchet stop. 8 00

6″ From 5 to 6″, with ratchet stop. 8 50
5 inch standard, $1.50

Set of three Micrometers, 1, 2, and 3″, without ratchet stop.....$15 50
In case, $17 50

Set of three Micrometers, 1, 2, and 3″, with ratchet stop..... 17.00
In case, $19 00

Set of six Micrometers, all sizes from 1 to 6″, without ratchet stop..... 36.00
In case, $40.00

Set of six Micrometers, including all sizes from 1 to 6″, with ratchet stop..... 39.00
In case, $43.00

## MICROMETER CALIPERS

### The Brown and Sharpe Mfg. Co.'s

Fig. 399A

Nos. 806, 807

These Calipers are entirely new in design and intended to meet the demand for a tool adapted to measuring small internal dimensions. They are graduated to read to thousandths of an inch.

No. 806 will measure internal diameters of surfaces from two-tenths of an inch to one inch.

The measuring screw is entirely enclosed, thus protecting it from injury. The measuring surfaces are hardened and ground to gauges to insure accurate measurements and prevent clamping when measuring parallel surfaces.

Each Caliper is provided with a clamp screw to preserve the setting.

| No. | | Each |
|---|---|---|
| **806** | Range .200″ to 1″ by 1000ths of an inch | $5 00 |
| **807** | Range 1 to 2″ by 1000ths of an inch | 6 00 |

Morocco case for 806, $0.50; for 807, $0.75

### Micrometer Head

Fig. 399B

These Micrometer Heads are readily attached to machines or tools, when fine adjustments are required.

Length, from lower end of barrel to shoulder, ¾″; diameter, ⅝″.

| | |
|---|---|
| Graduated to 1000ths of an inch, with or without ratchet stop | $3 50 |
| Graduated to 1000ths and 10000ths of an inch with or without ratchet stop | 4 50 |

### Inside Micrometers

Fig. 399C

Nos. 801, 803

These Gauges consist of a holder with a micrometer screw and thimble graduated to .001″.

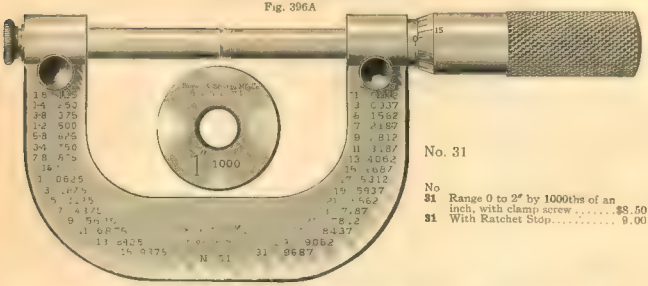
The extension rods are graduated by a series of angular grooves of a form and depth that allow the clamping fingers to spring in and the adjustments quickly and positively made.

| No. | | Without Case | With Case |
|---|---|---|---|
| **801** | Range 2″ to 12½″, 7 rods, each | $5.50 | $6.50 |
| **803** | Range 8″ to 36″, 8 rods, each | 7.50 | 9.00 |

## MICROMETER CALIPERS

### The Brown and Sharpe Mfg. Co.'s

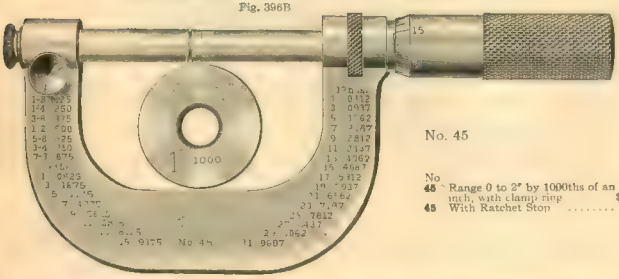
Fig. 396A



No. 31

| No | | |
|---|---|---|
| 31 | Range 0 to 2" by 1000ths of an inch, with clamp screw | $8.50 |
| 31 | With Ratchet Stop | 9.00 |

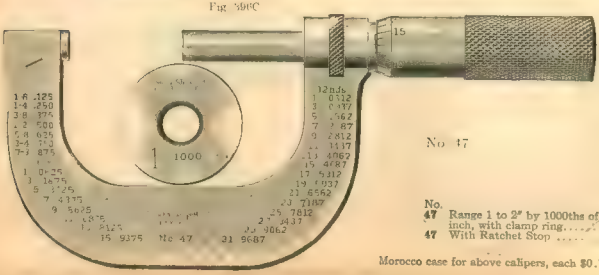
Fig. 396B



No. 45

| No | | |
|---|---|---|
| 45 | Range 0 to 2" by 1000ths of an inch, with clamp ring | $8.00 |
| 45 | With Ratchet Stop | 8.50 |

Fig. 396C



No. 47

| No | | |
|---|---|---|
| 47 | Range 1 to 2" by 1000ths of an inch, with clamp ring | $6.00 |
| 47 | With Ratchet Stop | 6.50 |

Morocco case for above calipers, each $0.75.

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. 39086–Genuine Stag Handle, [illegible] brass lined German silver bolsters three blade — Per Doz. $18 00

No. 3267 Stag Handle, [illegible] brass lined German silver bolsters three blade. — Per Doz. $15 00

No. — Per Doz.
3202–Stag Handle, 3⅜ in. brass lined German silver bolsters, three blade.. $17 00
3204–Pearl Handle, 3⅜ in. brass lined, German silver bolsters, three blade. $27 00

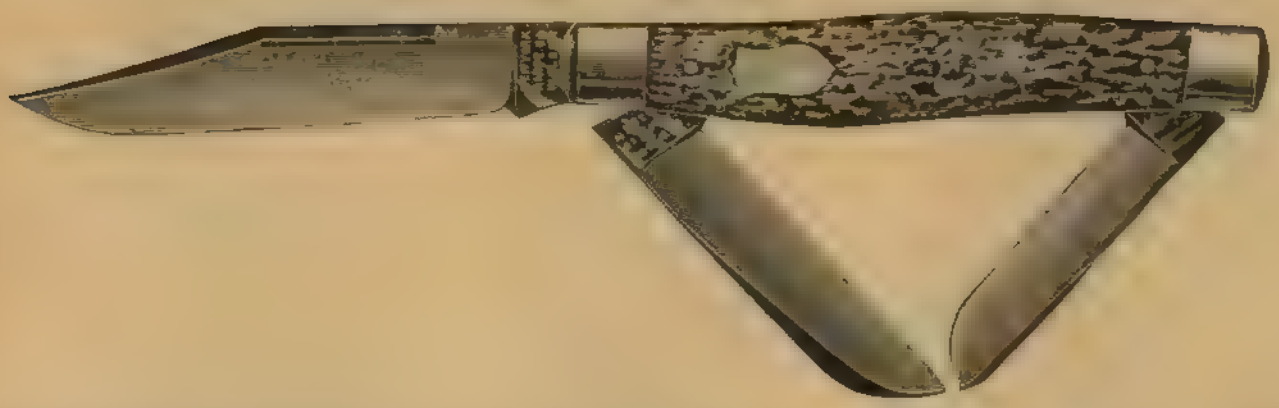
No. — Per Doz.
3723 Stag Handle, 3½ in. brass lined German silver bolsters, three blade $15 00

Full Size Cuts. One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted



| No. | | Per Doz. |
|---|---|---|
| 3515–Stag Handle | Premium Stock, 3⅞ in., Brass lined, German silver bolsters, three blade | $15.00 |
| 35156–Genuine Stag Handle | Premium Stock, 3⅞ in., Brass lined, German silver bolsters, three blade | 18.00 |
| 3517–Pearl Handle | Premium Stock, 3⅞ in., Brass lined, German silver bolsters, three blade | 36.00 |

| No. | | Per Doz. |
|---|---|---|
| 3315–Stag Handle, | Brass lined, polished German silver bolsters, three blade, | $18 00 |
| 33156–Genuine Stag Handle, | 3⅞ in., Brass lined, polished German silver bolsters, three blade, | 24 00 |
| 3318–Pearl Handle, | 3⅞ in., Brass lined, polished German silver bolsters, three blade | 36 00 |

| No. | | Per Doz. |
|---|---|---|
| 34256 | Genuine Stag Handle, 3⅛ in., German silver bolsters and lining, two blade | $24 00 |

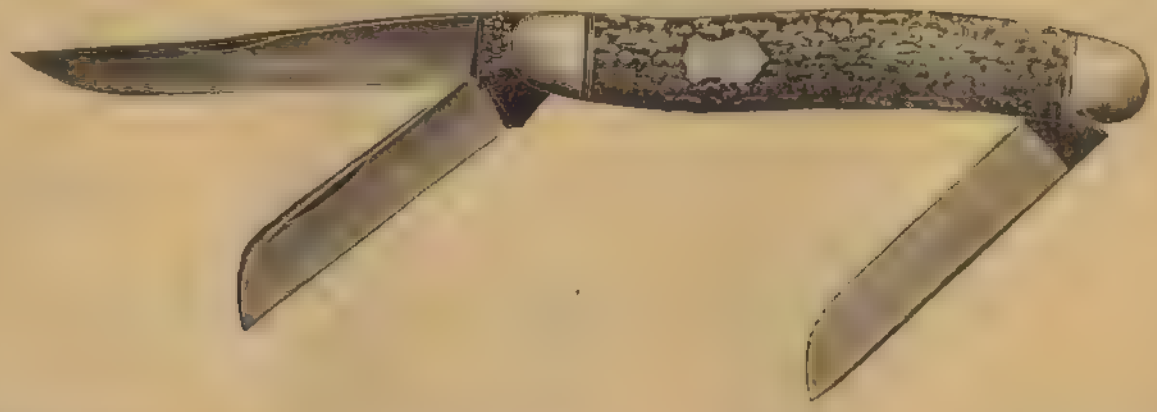
Full Size Cuts. One half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. Per Doz.
**3815**–Stag Handle, 3⅞ in., brass lining, milled German silver bolsters, three blade . $21 00
**3816**–Pearl Handle, 3⅞ in., brass lining, milled, German silver bolsters, three blade . 42 00



No. Per Doz.
**3423**–Stag Handle, 3⅞ in., German silver bolsters and lining, milled, three blade.. $21 00
**3424**–Pearl Handle, 3⅞ in., German silver bolsters and lining, milled, three blade. 42 00

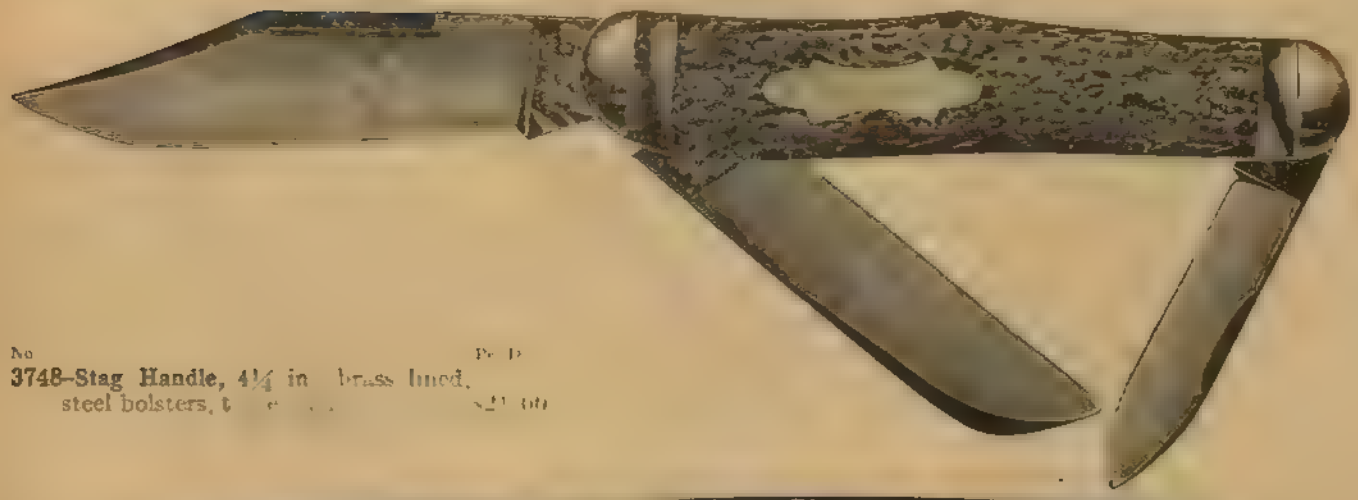
No. Per Doz.
**3193**–Stag Handle, 4⅛ in., brass lined, German silver bolsters . $21 00

Full Size Cuts. One half Size Cuts.

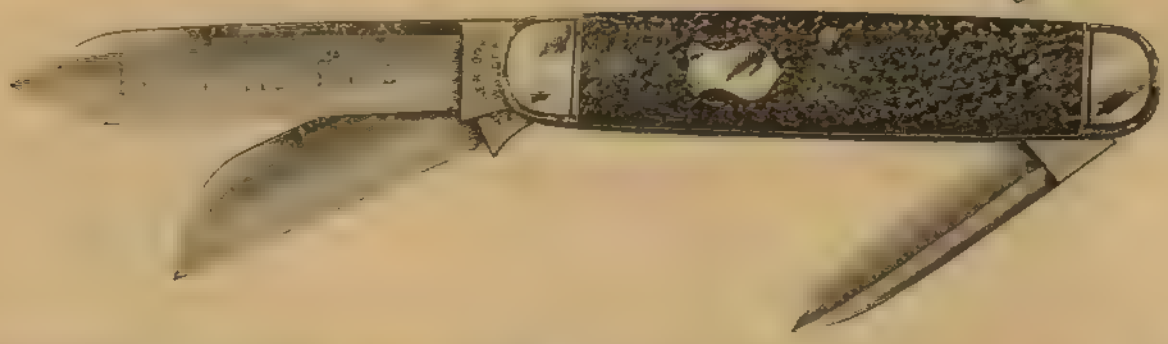
# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

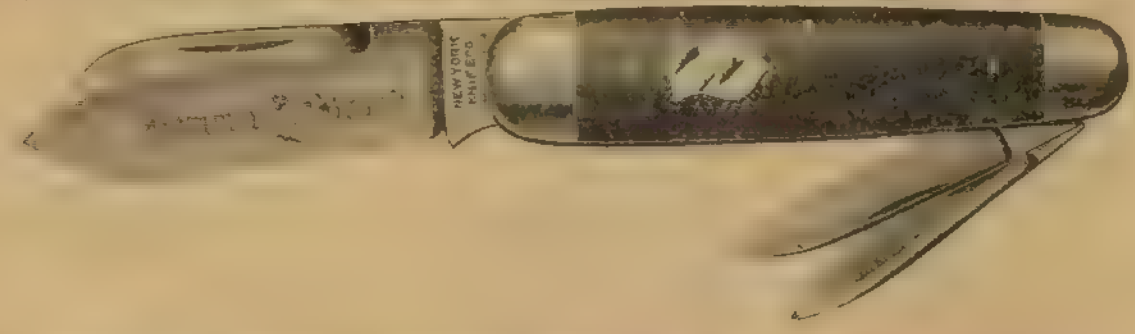
Fully Warranted



No. Per D
**3748–Stag Handle, 4¼ in. brass lined, steel bolsters, t**



No.
**3146—Stag Handle, 4 in., Cat's Paw brass lined German silver bolsters, three blade**
Per Doz
$24.00



No.
**311–Ebony Handle, 3½ in., brass lined German silver bolsters, three blade.....**
Per Doz
$15.00

No.
**3232–Stag Handle, 3¾ in., brass lining, milled, German silver bolsters. Lock Back.**
Per Doz
$24.00

Full Size Cuts. One half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

| No. | | Per Doz |
|---|---|---|
| **323–Pearl Handle,** 2¾ in., brass lined, German silver bolsters, two blade and nail file . | | $18 00 |
| **322–Stag Handle,** 2¾ in., brass lined, German silver bolsters, two blade and nail file .. | | 13 00 |

| No. | | Per Doz |
|---|---|---|
| **324–Pearl Handle,** 2 [illegible] | | $18 00 |

| No. | | Per Doz |
|---|---|---|
| **3359–Stag Handle,** 3 in., brass lined, German silver bolsters, two blade and nail file .. | | $13 00 |
| **3356 Pearl Handle,** 3 in , brass lined, German silver bolsters, two blade with nail file . | | [illegible] |

| No | | Per Doz |
|---|---|---|
| **3063–Pearl Handle,** 3 in , brass lined, German [illegible] | | [illegible] |
| **3061–Stag Handle,** 3 in. Brass lined, German [illegible] | | [illegible] |

| No | | Per Doz |
|---|---|---|
| **371–Pearl Handle,** 3⅛ in., brass lined, German silver bolsters, three blade.. | | $24 00 |
| **372–Stag Handle,** 3⅛ in., brass lined, German silver bolsters, three blade... | | 15 00 |

Full Size Cuts. One-half Doz. in a Box

# Pocket Knives

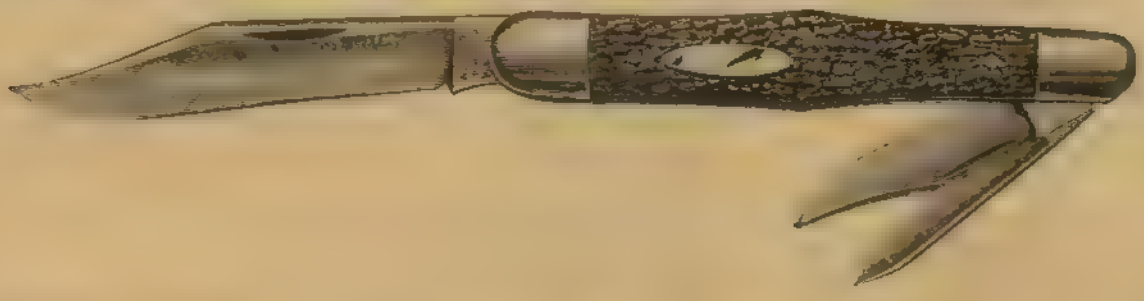
## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

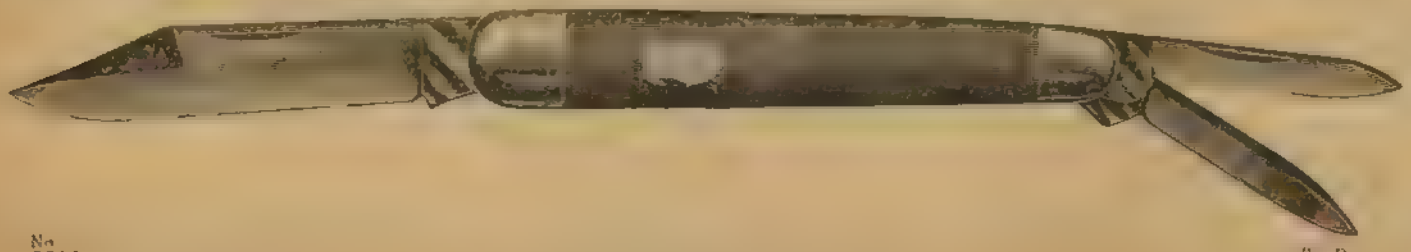
| No. | | Per Doz. |
|---|---|---|
| 3045 | Stag Handle, 3¾ in., brass lined, three blade.. | $15 50 |
| 3047 | Pearl Handle, 3¾ in., brass lined, three blade... | 24.00 |

| No. | | Per Doz. |
|---|---|---|
| 3048 | Stag Handle, [illegible] | $15 00 |
| 3084 | Pearl Handle, [illegible] | 21.00 |

| No. | | Per Doz. |
|---|---|---|
| 3915 | Stag Handle, [illegible] | $15 50 |
| 39156 | Genuine Stag Handle, [illegible] | 15 00 |
| 3917 | Pearl Handle, [illegible] | 24 00 |



| No. | | Per Doz. |
|---|---|---|
| 307 | Stag Handle, [illegible] lined, German silver bolsters, three blade.. | $15 00 |
| 309 | Pearl Handle, [illegible] German silver bolsters, three blade | 27 00 |



| No. | | Per Doz. |
|---|---|---|
| 3306 | Ebony Handle, 3¾ in., brass lined, German silver bolsters, three blade | $15 00 |

Full Size Cuts, One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

| No. | | Per Doz. |
|---|---|---|
| 3295 | Stag Handle, 3½ in., brass lined, German silver bolsters, two blade and nail file | $15 00 |
| 3298 | Buffalo Horn Handle, 3½ in., brass lined, German silver bolsters, two blade and nail file | 15 00 |

| No. | | Per Doz. |
|---|---|---|
| 3119 | Stag Handle, 3¼ in., brass lined, German silver bolsters, three blade | $15 00 |

| No | | Per Doz. |
|---|---|---|
| 3272 | Pearl Handle, 3 in., German silver bolsters and lining, milled edges, three blade | $27 00 |
| 3271 | Stag Handle, 3 in., German silver bolsters and lining, milled edges, three blade | 17 00 |

| No. | | Per Doz. |
|---|---|---|
| 343 | Stag Handle, 3½ in., brass lined, German silver tipped, two blade and nail file | $18 00 |

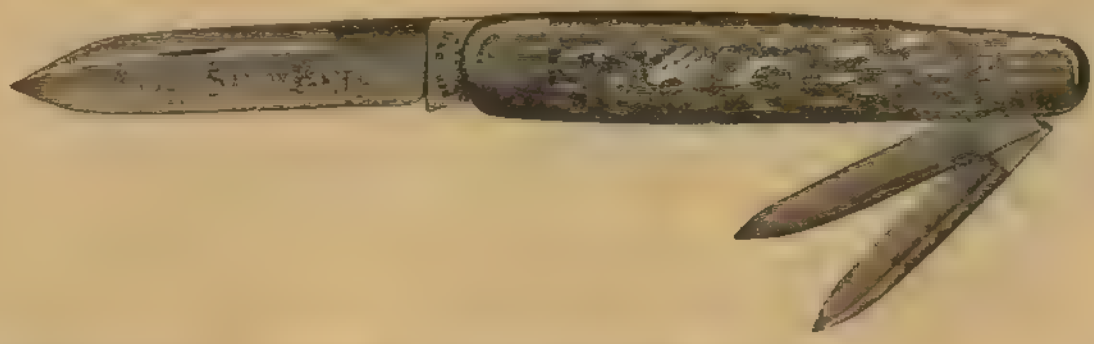
Full Size Cuts. One-half Doz. in a Box

# Pocket Knives

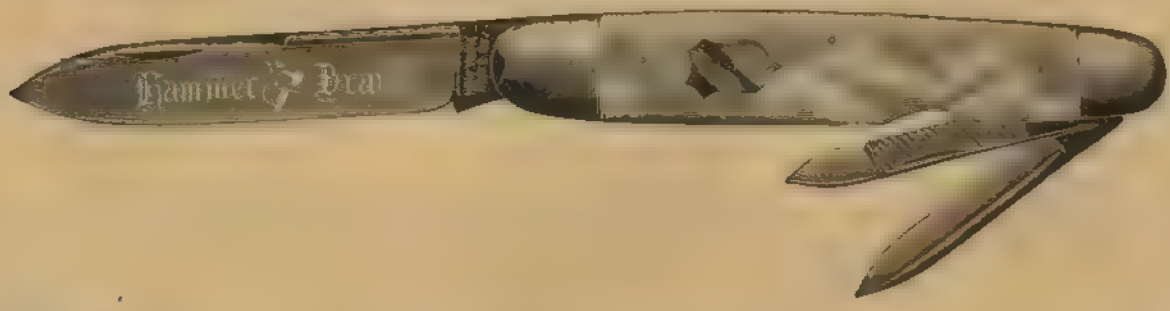
## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

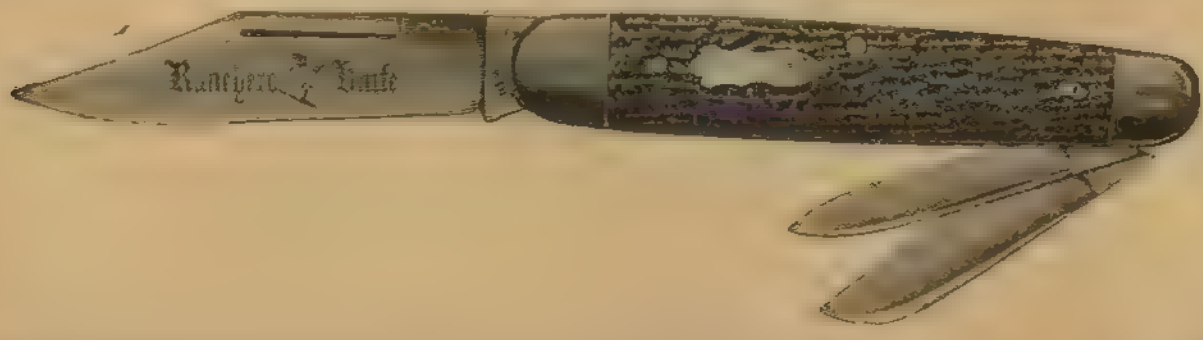
| No. | | Per Doz. |
|---|---|---|
| 361 | **Stag Handle,** 3⅝ in., brass lined, German silver bolsters, three blade ... | $18 00 |
| 363 | **Pearl Handle,** 3⅜ in., brass lined, German silver bolsters, three blade... | 30 00 |



| No. | | Per Doz. |
|---|---|---|
| 31276 | **Genuine Stag Handle,** [illegible] brass lined, German silver bolsters, three blade | $18 00 |




| No. | | Per Doz. |
|---|---|---|
| 3229 | **Pearl Handle,** 3⅛ in., brass lined, German silver bolsters, three blade..... | $33 00 |
| 32276 | **Genuine Stag Handle,** 3⅛ in., brass lined, German silver bolsters, three bl..l | 21 00 |



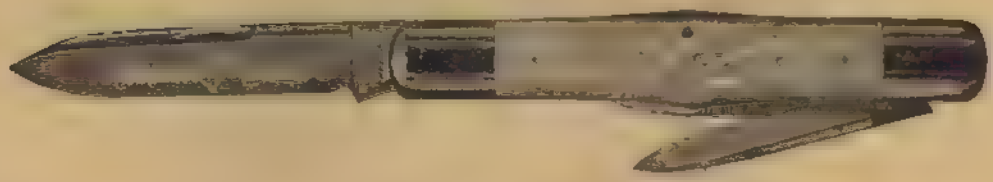

| No. | | Per Doz. |
|---|---|---|
| 31896 | **Genuine Stag Handle,** brass lined, German silver bolsters, three blade | $21 00 |

Full Size Cuts, One-half Doz. in a Box.

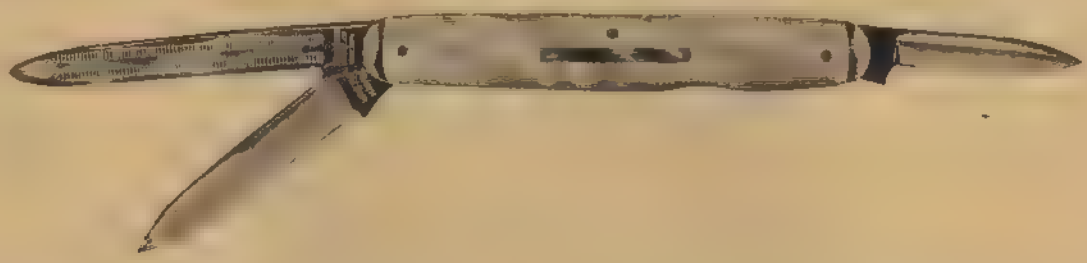
# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted



No. | Per Doz.
397 Pearl Handle, 3¼ in., brass lined, German silver bolsters, two blades and nail file . . . $21 00



No. | Per Doz.
3095-Pearl Handle, 2¾ in., German silver bolsters, brass lining, milled edges, two blade and nail file . . $24.00

No. | Per Doz
3360-Pearl Handle, 3 in., brass lined, two blade and nail file . . $24 00

No. | Per Doz
3041-Pearl Handle, 2¾ in., German silver lining, milled edges, two blade and nail file . . $24 00

No. | Per Doz
3900 Pearl Handle, 2¾ in., thin model, German silver lining, milled edges, two blade and nail file . . $27 00

Full Size Cuts, One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. 317–Pearl Handle, 3 in., brass lined, German silver tips, two blade and nail file — Per Doz. $27.00

No. 3757–Pearl Handle, 3½ in., brass lined, German silver bolsters, three blade — Per Doz. $22.00

No. 3109 Pearl Handle, 3¼ in., brass lined, German silver bolster, two blade and nail file — Per Doz. $30.00

No. 3901–Pearl Handle, 3 in., three model, German silver lining, two blade and nail file — Per Doz. $30.00

No. 3025 Pearl Handle, 3 in., German silver lining, pearl edges, two blade and nail file on top — Per Doz. $30.00

Full Size Cuts, One half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. Per Doz.
**3037–Pearl Handle,** 3¼ in., German silver lining, milled edges, two blade and nail file on back . . . . . $53 00

No. Per Doz.
**340–Pearl Handle,** 3¼ in., German silver lining, milled edges, two blade and nail file . . . . . $33 00

No. Per Doz.
**3605–Pearl Handle,** 3 in., German [illegible] holsters, brass lining, milled edges, one blade nail file and scissors $33 00

No. Per Doz.
**3276–Pearl Handle,** 3 in., German [illegible] lining, milled edges, two blade and nail file $30 00

Full Size Cuts, One-half Doz. in a Box

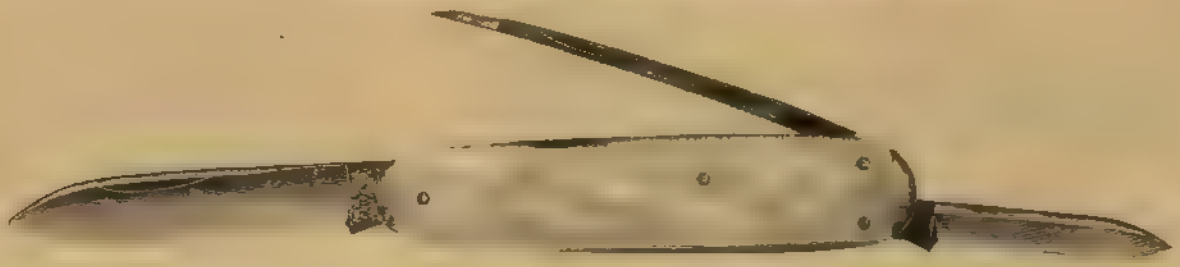
# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. | Per Doz.

**3374–Beveled Pearl Handle,** 2[illegible] in., German silver lining, nulled edges, two blade and nail file ..... $36.00



No. | Per Doz.

**3282–Pearl Handle,** 3 in., German silver bolsters and lining, nulled edges, two blade and nail file on back ..... $36.00

No. | Per Doz.

**3280–Beveled Pearl Handle,** 3 [illegible] in., German silver lining, nulled edges, two blade and nail file on back $36.00

No. | Per Doz.

**4196–Stag Handle,** 3⅜ in., brass lined, German silver bolsters, four blade ..... $21.00

Full Size Cuts One half Doz. in a Box

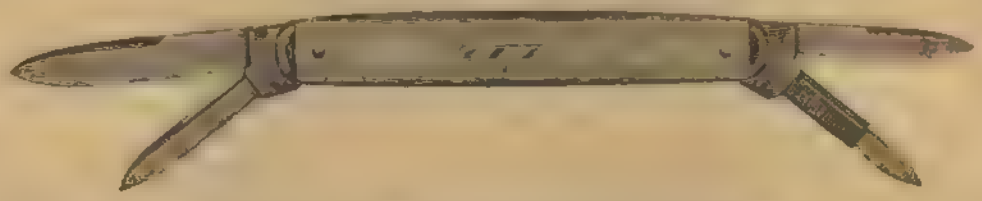
# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

| No. | Per Doz. |
|---|---|
| **42156–Genuine Stag Handle,** 3 x n , German silver bolsters and lining, milled edges, four blade . . . . . | $24 00 |
| **4217 Pearl Handle,** 3⅛ in., German silver bolsters and lining, milled edges, four blade. . | 36 00 |

| No. | Per Doz. |
|---|---|
| **4359–Stag Handle, 3 in.,** German silver bolsters, brass lining, milled edges, three blade and nail file. . . | $15.00 |
| **4366 Pearl Handle, 3 in.,** German silver bolsters, brass lining, milled edges, three blade and nail file . . . | 24.00 |



| No. | Per Doz. |
|---|---|
| **420–Pearl Handle,** 2⅞ in., German silver tips, brass lining, milled edges, three blade and nail file . . . | $24 00 |

| No. | Per Doz. |
|---|---|
| **485 Pearl Handle,** 3¼ in., German silver tips, brass lining, milled edges, three blade and nail file | $33 00 |
| **48366–Genuine Stag Handle,** 3¼ in., German silver tips, brass lining, milled edges, three blade and nail file | 21 00 |

| No. | Per Doz. |
|---|---|
| **4901–Pearl Handle,** 3⅛ in., shoe knife, German silver lining, milled edges, four blade and nail file . | $33 00 |

Full Size Cuts. One half Doz. in a Box

# Pocket Knives .

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. | Per Doz
449–Beveled Pearl Handle, 3½ in., German silver lining, milled edges, three blade and nail file . $36.00

No. | Per Doz.
456–Pearl Handle, 3¼ in., German silver lining, milled edges, three blade and nail file . $36.00

No. | Per Doz.
4617–Pearl Handle, 3 in., German silver tips, brass lining, milled edges, fancy etched backsprings, three blade and nail file.... $36.00

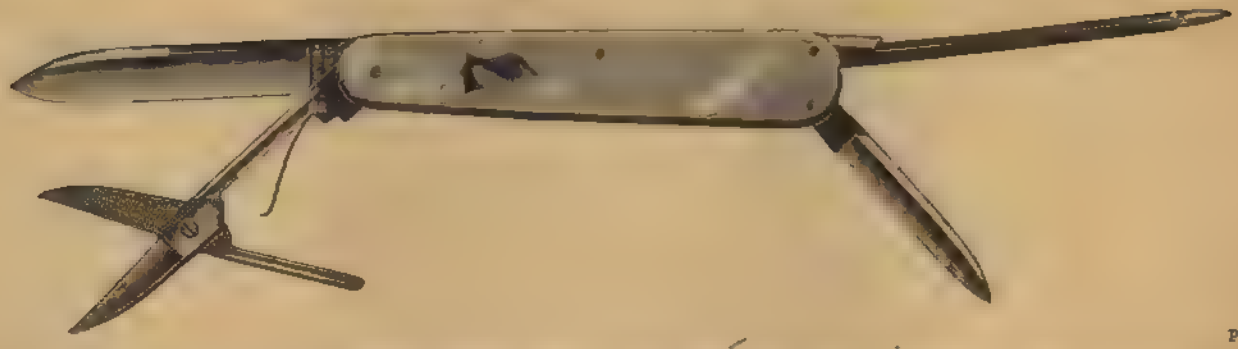
No. | Per Doz
3044–Beveled Pearl Handles, 3⅛ in., German silver tips, brass lining, milled edges, three blade and nail file $42.00

Full Size Cuts. One Dozen in a Box

# Pocket Knives

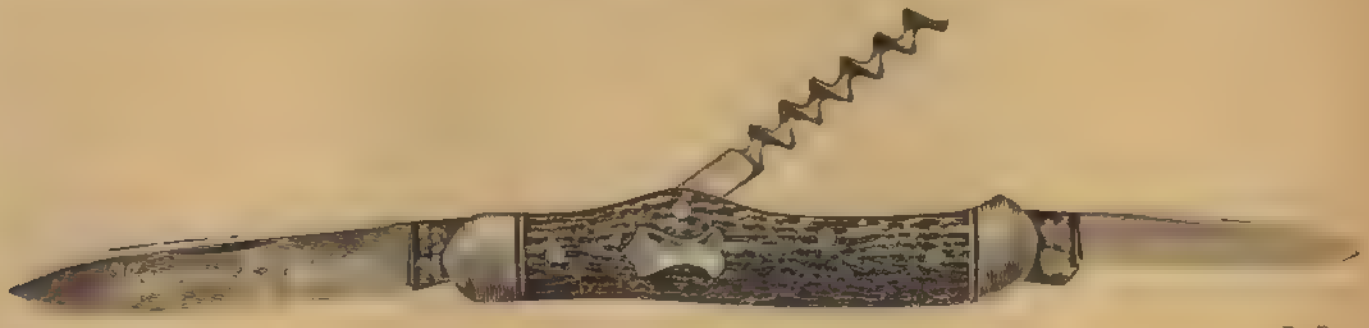
## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted



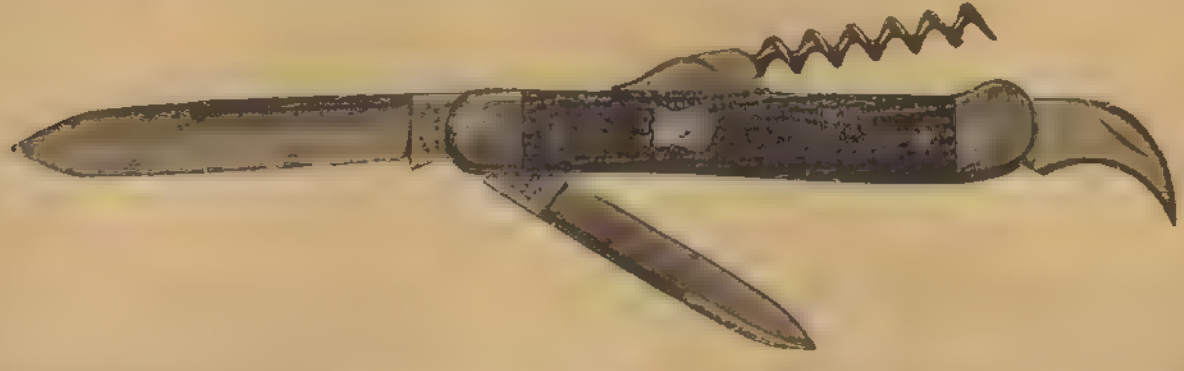
No. — Per Doz.

**444–Beveled Pearl Handle,** 2¾ in. German silver lining, milled edges, two blade, scissors and nail file on back — $48.00



No. — Per Doz.

**388–Stag Handle,** 3¼ in. brass lined German silver bolsters, two blade and cork screw — $24.00



No. — Per Doz.

**4016–Beveled Pearl Handle,** 3¼ in. brass lined, German silver bolsters, two blade, wire cutter and cork screw — $42.00

Full Size Cuts, One-half Doz. in a Box

# The Perfected "Great Chadwick Six" Automobile

BY E. S. FOLJAMBE.

The Chadwick Engineering Works, of Pottstown, Pa., in 1906 began building six-cylinder cars exclusively, prior to which time their product was confined to powerful, high-priced, four-cylinder automobiles.

For 1909 they are manufacturing two types of chassis, one having 130-inch wheel base, which may be fitted with a touring, tourabout or limousine body, and one with 112-inch wheel base, for either runabout or racing body.

The object of the Chadwick Co. is to build a limited number of high-powered, high-grade cars which will endure the hardest service and cover an enormous mileage at a minimum cost for up-keep. The manufacturers tell us that when their first six-cylinder car was designed, they did not know whether it would be sold for five or six thousand dollars; that the car was built along lines they had set down and believed to be correct, and that the price was made to fit the car—not vice versa.

TOURING CAR

Although the Chadwick Co. has to a certain extent been identified with racing, and has entered its runabout in several of the most prominent contests, the important part of the output is the touring car, for the speed runabout being placed on the market is designed to meet the demand for such a car by a certain and somewhat limited class of purchasers.

The touring model, as stated, has 130-inch wheel base, 36-inch wheels fitted with 4-inch front tires and 5-inch rear tires. The car is large, speedy and very luxuriously upholstered and appointed. It has two extra comfortable seats arranged in the tonneau (folding type or a bucket type optional), both of these being arranged to fit into a single supporting bracket. This gives a seating capacity in the tonneau of five, the two additional seats being pivotted so that the occupants may face in any direction desired. The side entrance doors

The Chadwick Great Six, motor 6 cylinder vertical, cast in pairs, 5x6 in., 60 H. P., valves on opposite sides, [illegible] back from dry cells and Bosch magneto, special expanding leather lined cone clutch as described in the text and illustrated elsewhere in detail. Wheel base [illegible] 36x4 in. tires front, 4½ rear, [illegible] nickel pressed steel frame [illegible] front springs, 40x2. Ill leaves fro[illegible] semi-elliptic rear springs 48 [illegible]x2½, specia[illegible] safety ti[illegible]k [illegible] and [illegible] of wh[illegible] are [illegible] front [illegible] described in text. [illegible]s car contains a large [illegible] and is [illegible] with 130-in. wheel base. Touring car complete $[illegible] seats 7 passengers weighs 3500 lbs. The to[illegible]g [illegible]dy is placed on the 1[illegible]0-1 wheel base. Equipped [illegible] gas lamps, horn and tools [illegible] foot driving chains etc.

The power plant and general construction are alike in all models, the difference in minor details only making the difference in the types, with the exception of the runabout, which, although constructed along the same general lines of the touring car and tourabout, has a wheel base of but 112 inches, is fitted with special tanks for oil and gasoline, and an attachment which greatly increases the horse-power and speed. In describing the mechanical features, they are the same as apply to all models, unless special exceptions are made The wheel base of the touring car and tourabout is 130 inches.

are very large, hinged at the rear, and so mounted that they swing upward and outward, passing free of the mud guards These doors are 24 inches in width. The front seats are divided by a low partition, and the steering post has sufficient rake for a touring car, but is given considerably more rake on the runabout and tourabout models. The floor boards are inclined at about an angle of 45 degrees, to assure comfort to the operator. A plain, brass-edged, 3-ply mahogany dash carries a single coil, a single oil sight feed, a small gauge for gasoline tank pressure and a gasoline adjustment to the carburetor, the

oil into the crank case when speeding. The entire oiler capacity is also larger, but the oiler is driven in the same manner as on the other models. Oil is supplied by pressure feed from the main tank at the rear, which contains about 10½ gallons.

This stock model is identically the same

without affecting the adjustment, and is, to the knowledge of the writer, the only clutch having this feature. There have been clutches made where the rim of wearing surface could be removed, but they could not be replaced without readjustment. An aluminum spider carries a de-

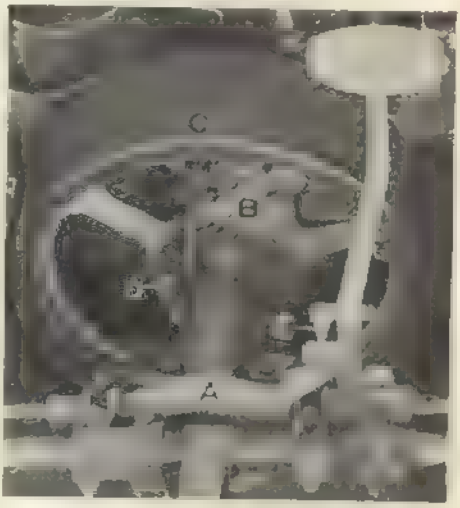
The [illegible] side of the Chadwick Great Six showing [illegible] complete protection [illegible] of the [illegible] working mechanism [illegible] working securely housed so that [illegible] from the working [illegible] Note the pro[illegible] of the cross link of the steering gear. The large platform rear springs [illegible] chain cases.

in construction as the cars which have been entered in the recent hill climbs; in fact, is a continuation of these cars as a regular stock model for 1909, thus placing on the market cars which can be used for entering any speed contest. In regard to the speed possibilities of this runabout, it is sufficient to say that one of these cars made an average of 74 1-5 miles an hour up Skippack Hill at the Norristown Hill Climb some months ago, and in practicing for the Vanderbilt Race attained a speed of 107 miles an hour on the Jericho Turnpike, and in the Vanderbilt Race led up to the seventh lap, at which time it was, as recorded in these pages, put out of the running by an injured magneto. All the runabouts are fitted, as part of the regular equipment, with demountable rims, the tires being 36x4½ inches front and rear, and with complete equipment, including two extra demountable rims, sells for $6500.

CLUTCH

The new clutch introduced in this year's model is of the removable rim, expanding type, but of exclusive design and construction. Provision is made for removing the band for inspection in from one to two minutes without disturbing the adjustments. Its action and process of engagement with the flywheel is extremely soft, being free from jerk or noise, and is susceptible to a very slight foot pressure. The flywheel is 18 inches diameter, has a 6-inch face, and is mounted on an integral shaft flange by six through bolts and castle nuts. The expanding brake clutch rim has a leather wearing surface, which comes in contact with the inside of the flywheel. The feature of this clutch is the fact that the band is mounted on a rim which can, by unfastening three nuts, be removed, cleaned, oiled, scraped, etc., and put back

mountable, leather-faced band, and three small lips, held by castle nuts at the end of the spokes of this spider, hold it in position. A foot lever operates the usual yoke, which, in this case, moves the sliding sleeve on the outside of the shaft run-




Big [illegible] plan of the [illegible] clutch [illegible] is [illegible] which is operated by the usual pedal as shown through yoke A by [illegible] connecting [illegible] rod. The [illegible] ring pivot [illegible] adjusting collar so that the [illegible] of the pedal can be arranged to suit individual purchaser. A [illegible] shaft B is rotated by the [illegible] operated by the yoke A and [illegible] C by the rack and pinion [illegible] clutch spring spreads the bands [illegible] with the inner periphery of the flywheel. When speed centrifugal force throws the band outward [illegible] rim and increases its gripping power. The [illegible] and its facing can be removed and replaced without losing the adjustment of the clutch, which is an entirely unique feature not possessed by any other to the knowledge of the writer.

The long hood is not only retained by means of very effective spring fasteners, but also by means of two broad straps, which are supplied on all models.

SPECIAL NEW FEATURES.

Quite a number of novel and meritorious features have been introduced in the new models which bear the title, "Perfected Great Chadwick Six." These will be briefly mentioned now and fully described hereafter.

1. A device termed a safety link has been placed on the front springs, which prevents shifting of the position of the axle in case of spring breakage, which obviates danger through the inability of the operator to steer.

2. The timing of the magneto is so arranged that the point where the break occurs is always at the time of greatest intensity, so that the maximum spark results, even at slow speeds, such as when the engine is turned over by hand.

10. Substitution of improved type of honey-comb radiator instead of the cellular type previously used.

11. Chrome nickel steel time gear, cam shafts and cams ground by special machines; valve lifts readily adjustable.

12. New steering gear, Chadwick design; instantly adjustable, with large steering post and 19-inch wheel. Steering device made of chrome nickel steel throughout.

13. Heavier and improved gear shift, lever, segment and locking device and emergency brake lever. All foot pedals and acceleerator ajustable for comfort of operator.

14. Much larger bodies and refinement in details and workmanship.

NEW FEATURES PECULIAR TO THE RUNABOUT.

A special feature on the runabout is the arrangement of short branches of the exhaust manifold so that they protrude through the side of the hood through brass rimmed ports. A foot button is provided,

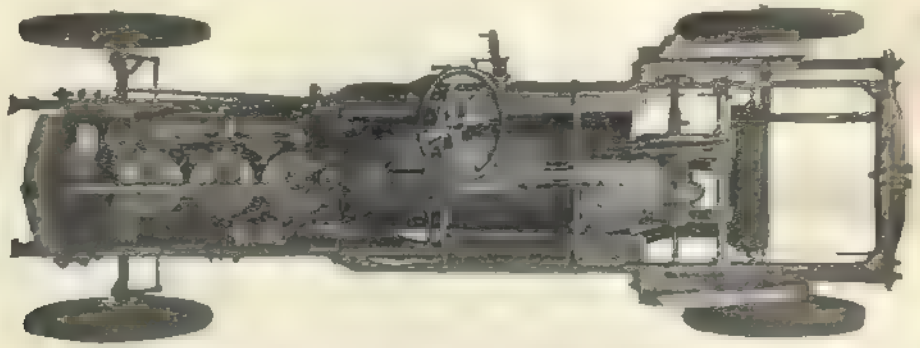


Fig. 3. Plan of Chadwick Great Six chassis, showing the arrangements of the parts in the frame, the reinforced side frame members being shown also, the transmission jack shaft and its special adjustable contracting brake and the silent [illegible] the rear wheels. These [illegible] are grease tight the chains running continuously in lubricant. Note the large circular applied copper water jackets to each pair of cylinders. The peculiar and special features are described in the text.

3. The method of driving the oiler has been changed, doing away with the flexible shaft formerly used, the substitute being a driving gear placed at the front of the engine, to mesh with the half-time gear, the driving being by means of a shaft having an Oldham coupling interposed. The oiler proper is placed at the left of the engine.

4. Copper water pipes of large size, placed on top of the engine.

5. Increase in size of exhaust manifold, permitting of quicker expulsion of gases and consequent reduction of back pressure.

6. Four very large improved brakes, equipped with air cooled shoes, 1¾ inches in thickness, instantly adjustable.

7. Improved internal expanding clutch, allowing removal for inspection in about two minutes.

8. Improved drive. Sprockets and chain of chrome nickel steel, so constructed and enclosed in oil cases that chain noise is eliminated.

9. Increased horse-power claimed to be about 35 per cent, resulting from refinement in design and construction without increase of bore and stroke.

which, when pressed, opens poppet valve exhaust cut-outs at the entrance of each of these branch tubes, so that the cylinders exhaust directly through the side of the hood. These cut-outs are absolutely tight, and if for any reason a small amount of dirt should get under the seats, the valves can be ground in place or rotated from the outside with a screw driver, so there is no trouble experienced with the exhaust gases leaking through the cut-out and causing a disagreeable noise, as often occurs with poorly constructed cut-outs.

The runabouts are so arranged that two magnetos can be placed at the left of the engine with the advancing and retarding mechanism between them, so that they work in unison and can both be used at once, insuring unfailing ignition. All of the runabouts are fitted with a special carburetor arranged particularly for high-speed work. A precision oiler of special size is used on the runabout models, the plungers of which are each of larger capacity, delivering double the quantity of oil to each individual lead. This does away with any necessity for hand pumping extra

CHASSIS OF THE PERFECTED

# Great Chadwick Six

**Wheel Base:** Seven-passenger Touring Car and Tourabout, 130"; Runabout 112". Altho 130" is usually considered a long wheel base it is not objectionable in the Chadwick, as the bottle neck frame construction enables the car to turn in as small a circle as the average automobile having but a 112" wheel base.

**Horse Power:** An absolute increase of 35 per cent in power is provided in new model this great increase is obtained by refinements and improvements, while the bore of 5" and stroke of 6" remains the same as in 1908 model The rating of 60 H P is taken at comparatively low motor speed -much greater horse-power is produced at high motor speed.

**Transmission:** Semi-selective, mounted on D. W. F imported ball bearings four forward speeds and reverse, actuated by single control lever Less effort is required to operate this gearshift than in any other system.

**Brakes:** Three very large and improved brakes, equipped with air-cooled shoes 1½" in thickness instantly adjustable The new brakes will endure more service and abuse than any brake hitherto used on a motor car Provision is made for quickly replacing brake shoe linings

## RUNABOUT

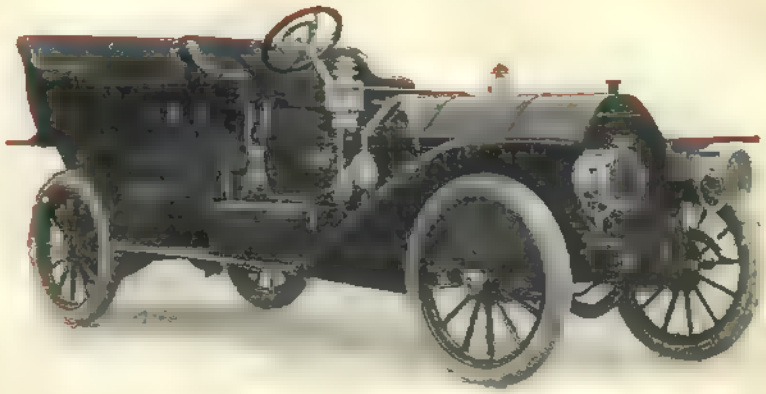
**Wheel Base, 112" Weight, 3000 lbs.**

**Positively the Fastest Stock Car in the World**

One of these cars stripped for racing, demonstrated a rate of speed exceeding 100 miles per hour. These cars are sold and built for those automobilists who [illegible] ideal combination of safe[illegible] With [illegible] for [illegible] a fast touring car [illegible] great fuel and oil economy—[illegible] miles [illegible] gallons [illegible] gasoline [illegible] construction that it is quickly convertible [illegible] great [illegible] touring [illegible]

If interested in this model, write for detailed information.

CHADWICK ENGINEERING WORKS
POTTSTOWN, PA.



Touring Car Price, $5500.00

# THE PERFECTED GREAT

# Chadwick

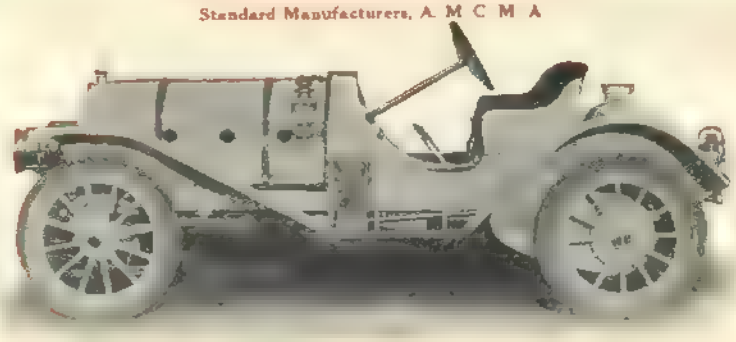
# SIX

(SEE DETAILS ON THREE NEXT PAGES)

## CHADWICK ENGINEERING WORKS

POTTSTOWN, PA., U. S. A.

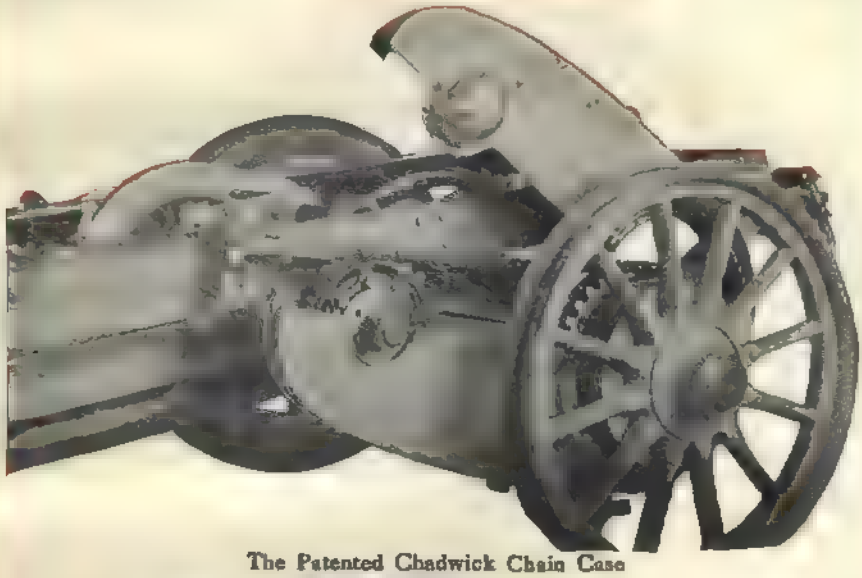
Standard Manufacturers, A. M. C. M. A.



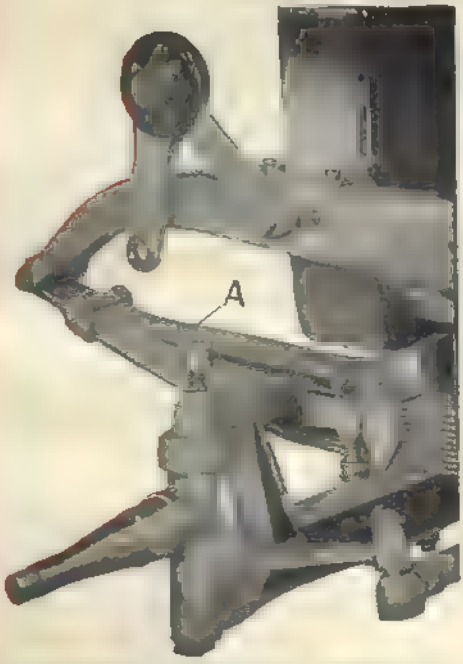
Runabout Price, $6500.00

Two of the Many Exclusive and Meritorious Features of the Perfected

# Great Chadwick Six



The Patented Chadwick Chain Case



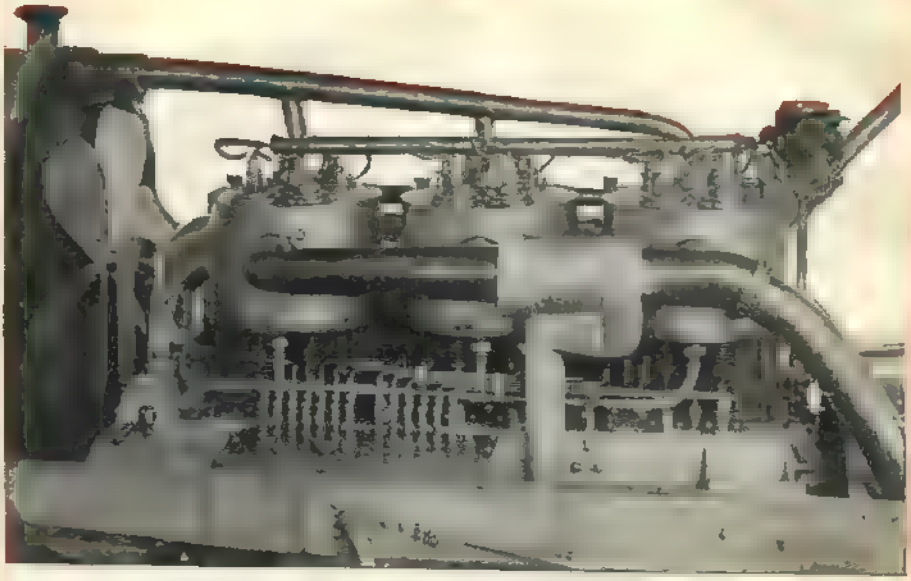

Chadwick Patented Safety Spring Link

This makes absolutely the only safe and silent form of drive in existence for high powered cars. Sprockets and chains are chrome nickel steel, and run in dust-proof, oil-filled cases, decreasing the noise and wear 75 per cent and avoid the necessity for having a split or divided rear axle

The Chadwick Safety Link is a device attached to the front spring, which prevents any shifting of the position of the steering mechanism in the event of breaking of the spring. It is an exclusive and at the same time an absolutely necessary device for high-power cars

**Chadwick Engineering Works**

**Pottstown, Pa.**

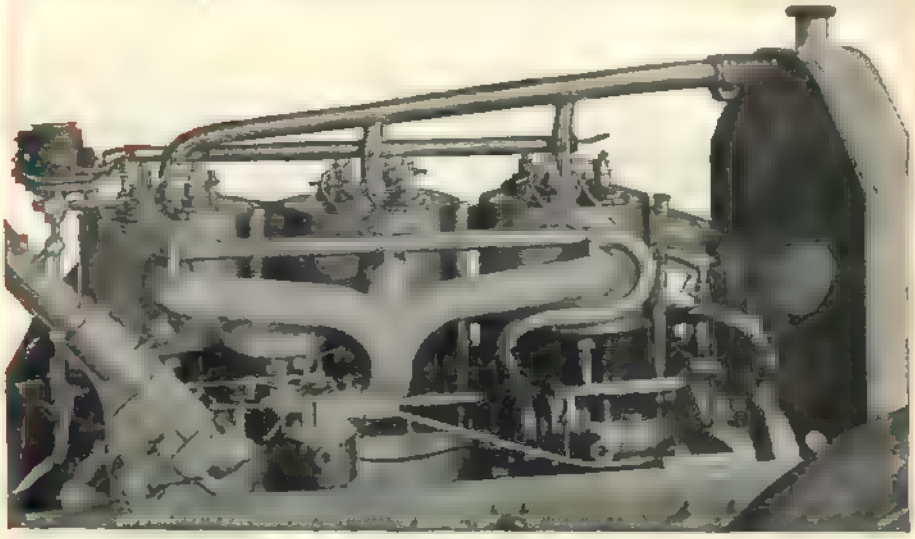


MOTOR OF THE PERFECTED

# Great Chadwick Six

**Motor:** Six cylinder, 5" bore and 6" stroke, cylinders copper jacketed in pairs. This system insures the perfect cooling of valves and stems and provides a volume of water surrounding cylinders which is from three to five times as great as in cast jacket type.

**Ignition:** Two complete systems, magneto and battery (Bosch Magneto, high tension Coil and high tension Distributer on battery system).



cylinder, with five-inch bore and six-inch stroke. According to A. L. A. M. rating, it is 60 H. P., but, according to actual development, it is much in excess of this

guard against cracked cylinder due to freezing, as the copper expands under pressure, thus saving the cylinder walls from strains which usually result in serious damage.

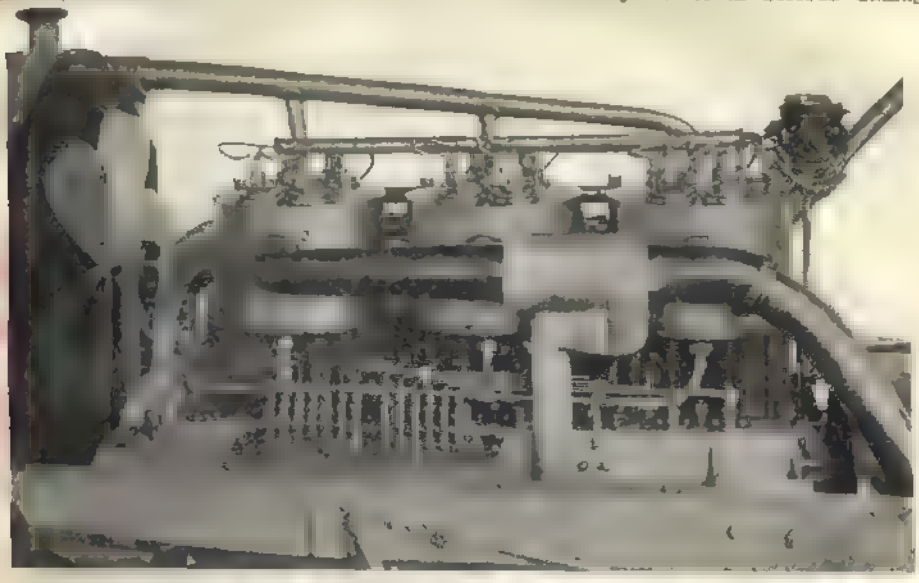


Fig. 8 Exhaust side of Chadwick [illegible] showing [illegible] for adjustable mounting of the fan, the tapered exhaust manifold [illegible] exhaust conduit and [illegible] particularly [illegible] arranging the oil [illegible] ples warm air [illegible] smallest [illegible]

amount. The cylinders are cast in pairs, and are completely surrounded by spun copper jackets, which provide for from three to five times greater volume of water in contact with the cylinders than is possible where the motors have cast water

This copper water jacket is a well-known, exclusive and patented Chadwick feature. The Chadwick Co. claims that so efficient is this cooling system that the fans have been removed from all cars entered in hill climbs, racing and other contests, and

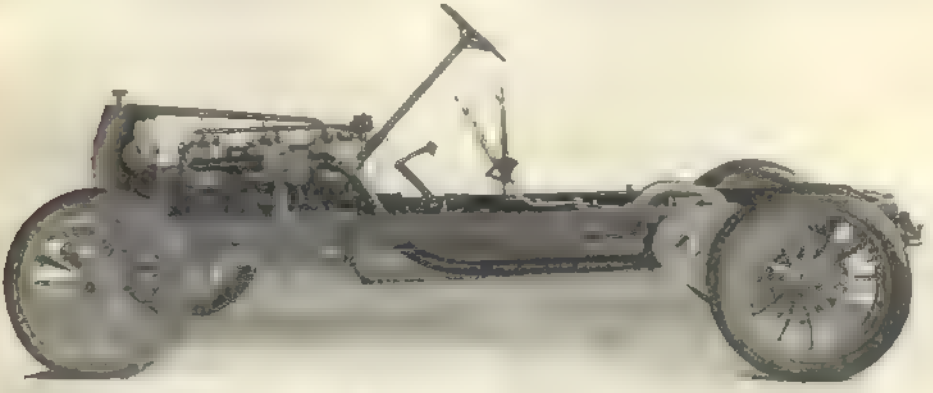


Fig. 9. Side view Chadwick Six chassis. This gives a good side view of the special gear case, a distinctive Chadwick feature fully described in the text. Also shows the sod pan, the arrangement and location of the control levers and pedals.

jackets. The claims made for this method of cooling are, first, overheating is impossible; second that the valve stems and their guides are surrounded by water, hence do not warp; third, that carbon deposits are minimized and valve actions are continually efficient, making grinding rarely necessary. This jacket also acts as a safe-

never have their cars heated the water sufficiently to cause it to steam.

The cylinder pair units are held to the aluminum crank case by six studs and castle nuts each, the studs being rivetted over on the under side. The crank case is somewhat heavier in construction than in previous models, in order to take care of

ning to the change speed gear case. The sliding sleeve carries a small rack operating a pinion and radial shaft inside of the clutch, the outer end of this shaft carrying a short crank surrounded by a hardened steel roller, so when this shaft is rotated by changing the position of the clutch pedal, the eccentric roller forces the end of the expanding band out of engagement with the fly wheel rim. The usual clutch spring, which is enclosed in a sleeve around the main shaft forces the band into engagement, the rotation of the fly wheel being such as to make the band grip, and at increased speeds the centrifugal force gives this band an additional grip. This clutch is light and very carefully balanced. It has been used in the cars entered in speeds contests, and having proved to give the best possible results, has been adopted for all the new Chadwick models.

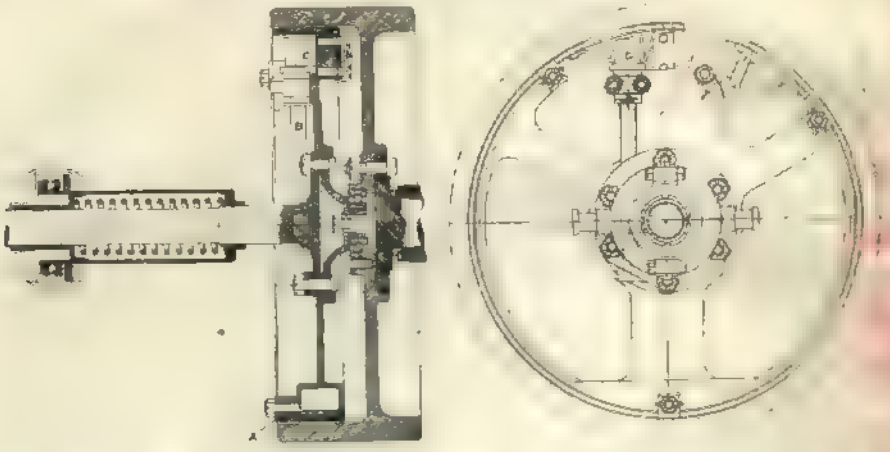


Fig. 6. Sectional drawing of Chadwick expanding band clutch showing the small clips A which hold the removable ring in position. Also shaft B and the eccentric pin C at its upper end. The clutch adjusting nuts are clearly shown. Note the castle nuts and other nuts locked by wires passed through holes in the heads, all typical of the locked adjustments used throughout the entire construction.

THE POWER PLANT

The power plant for all models is identical, consisting of the Chadwick six-cylinder engine, combining all the well-known Chadwick features which have been used in previous years, in addition to which there are several new and important details of construction. The engine is six-

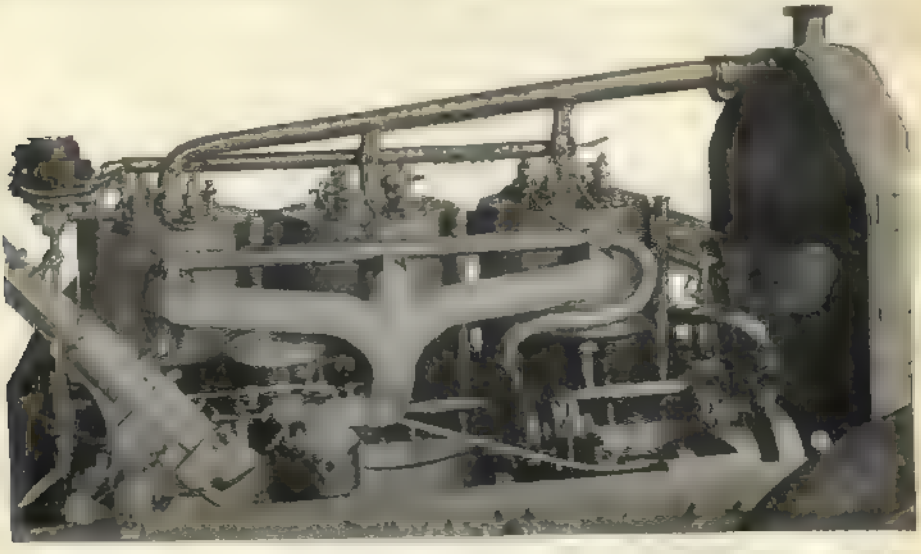


Fig. 7. Inlet side of Chadwick Great Six 60 H. P. motor 5x6. This motor normally develops very much more than 60 H. P. Note the arrangement of the upper water manifold for heating from the high tension magneto through the tube mounted on the intake manifold and the same neat arrangement of wires from the combination timer and distributor at the rear of the engine on the vertical shaft. This distributor is so arranged that the outer portion does not rotate but is perfectly stationary, the spark advance and retard being obtained by changing the relative position of the rotating contact on its shaft. This arrangement obviates breaking of connecting wires and is much more satisfactory than moving the outside portion.

wall of the wrist pin and into the piston boss. To prevent it from coming out of place there is a brass sleeve in the inside of the wrist pin and on the outer end is placed a fiber sleeve. Should any portion of this sleeve rub the cylinder wall, it will be the fiber, which, under no circumstances would in any way injure the cylinder. This very clever arrangement positively prevents the retaining pin from becoming loose, and thereby eliminates the possibility of the wrist pin having a side motion.

THE FAN

The fan is mounted on two annular bearings, and is driven by a flat belt which is rotated from an aluminum pulley attached to the engine shaft. The fan mounting consists of a vertical post with a central cap screw threaded through it, which, by turning, forces the post upward and makes the belt adjustment. The surrounding standard is split and grips the post by means of a pinching screw. Both cap and pinching screw have the same sized heads, permitting of the use of the same wrench in making adjustments.

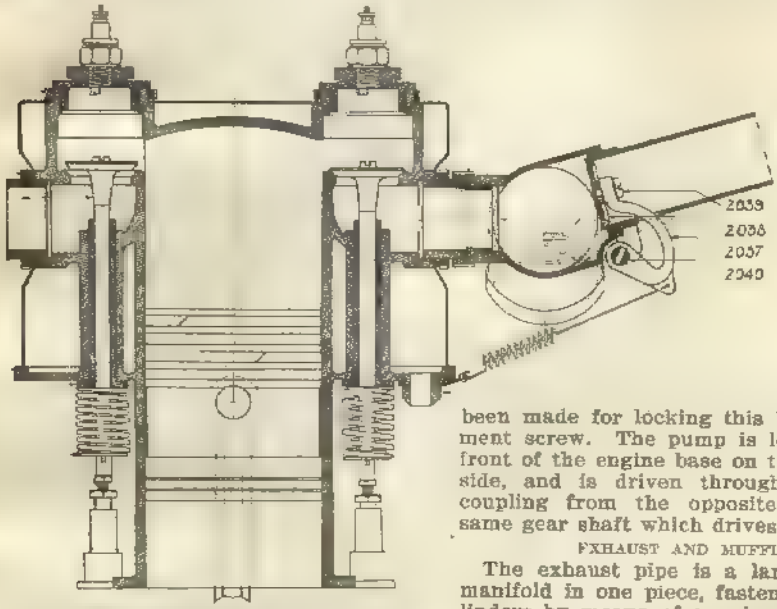



Fig. 11. Section of Chadwick cylinder copper water jacket, and exhaust manifold showing clearly the construction especially of the new exhaust relief valves which allow the exhaust of the motor to pass out directly through the sides of the hood. This valve is shown at the right the lever 2037 being pivoted on pin 2040, normally holds in close position the small valve 2038 by means of the coiled spring shown. However, from the dash this valve and lever by means of a push button can be swung into position shown in dotted line, thereby allowing the exhaust a direct passage to the air through the hood side. By means of the slotted screw 2039 it is possible to insert a screw driver directly from the outside of the hood without touching any of the parts and quickly rotate the valve in case any dirt particles should lodge under it preventing it from tightly closing. This view shows the method of retaining the lower rim of the cylindrical copper water jacket by means of a bevel ring. It also shows the inlet and exhaust valves and the arrangement of the spark plugs.

ALL ADJUSTMENTS ARE LOCKED.

This is one of the many noticeable features of the Chadwick car, which has numerous refinement details. The designer has endeavored to construct the various parts of the car, so that only the simplest tools need be used and adjusting and locking devices provided to prevent trouble. Castle nuts and oiling systems are universal throughout, and there are practically no adjustments in the car which are not permanently locked, but in such a way as to be instantly released if necessary.

WATER CIRCULATION.

A tall but comparatively shallow honeycomb radiator of high efficiency is now used, the water being drawn from the bottom by a centrifugal pump, which forces it through copper pipes to the lower portion of the water jackets. It is taken from the tops of the jackets, as usual, through a tapering drawn copper tube to the upper portion of the radiator. The feature of the pump is the use of another star wheel adjustment on the stuffing box, so it is a simple matter to poke this around with a screw driver and thus always keep the stuffing box tight. Proper provision has been made for locking this by an adjustment screw. The pump is located at the front of the engine base on the right hand side, and is driven through an Oldham coupling from the opposite end of the same gear shaft which drives the magneto.

EXHAUST AND MUFFLER.

The exhaust pipe is a large, cast iron manifold in one piece, fastened to the cylinders by means of a union. A threaded nipple (Fig. 11) with a flanged end is screwed into the exhaust manifold and an external nut grips the flange and screwing on to nipple in the cylinder forces the flange against the cylinder, a copper asbestos gasket being interposed. Exactly the same method is used for retaining the very simple aluminum inlet manifold. This method of coupling is arranged so that at each joint a motion of 1-16-in. in each direction is allowed for expansion or contraction and will not effect the tightness of the joint. The exhaust pipe is a 3-inch steel tube, which is carried backward in a graceful sweep without any short bends to a large and efficient muffler slung crossways of the frame near the rear. This muffler

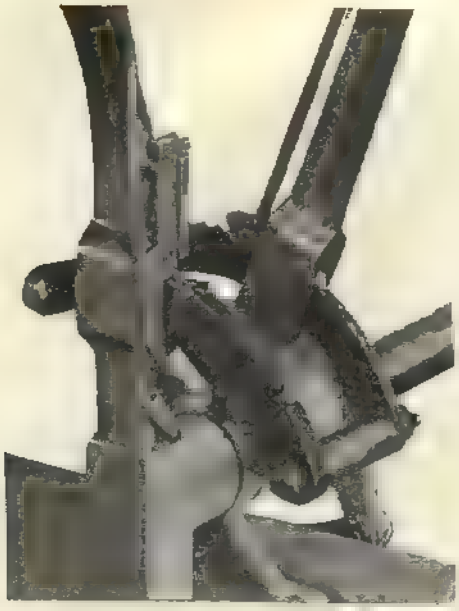


Fig 10 Chadwick patent gear shift levers. This gear shift lever has a special locking device so that it is impossible to go through a gear without releasing the grip latch. This device is in reality a ratchet and after being released this ratchet automatically drops into the next notch thus automatically finding the correct position for the gear shift it not being necessary for the operator to "fish for it." If it is desired to go straight through, this can be done as readily as with the ordinary gear shift lever by simply retaining the grip on the hand latch at the upper end of the lever The device makes certain of correct gear positioning instantly and without trouble on the part of the operator.

the strains due to the additional power developed by the perfected motors. It has an integral pan, and is supported on the frame by four integral cast aluminum arms of channel section. The lower half of the case is arranged for easy removal, to facilitate ready access to connecting rods and main bearings. Of the latter there are four, which are made of plastic bronze, the two center ones being supported from the upper half of the case, and the end ones from the lower half. The crank shaft is of the standard six-throw type, of chrome nickel steel, and each and every shaft contains exactly the same material as near as human ingenuity can make it. No shaft is made part of the motor assembling until it has shown that it tests to extreme limits for both strength and hardness, the latter being an important factor in the life of bearings. This may be better appreciated by the average owner when it is understood that this means the lessening of delays and troubles due to the taking up of bearings. The Chadwick Engineering Works have such great confidence in the wearing qualities of their bearings that they informed our representative they would be responsible for the statement that if the engine is suitably oiled and given fair attention, the connecting rod bearings would not have to be taken up more than once in two years.

The cam shafts are of the same general construction as previously used, consisting of applied cams, key retained, and properly distanced by spacing sleeves. These cams are hardened, and each shaft has the proper contour ground by a special machine controlled by a master cam, insuring correct contours and such accuracy as to eliminate the possibility of cam-shaft irregularities, which means that each camshaft is indexed exactly alike, so that the timing of every engine is precisely the same and parts are interchangeable.

The pistons, also connecting rods are all balanced, so they weigh within a fraction of an ounce of each other. The connecting rods are drop forgings of the usual I-beam sections, the caps retained by castellated nuts. The wrist-pins are hardened steel, and finished by grinding. All of the bearings of the motor are exceptionally large, which insures long life to the wearing surfaces. All driving gears of the engine assembly—and, in fact, all gears in the car—are of hardened steel. These gears are encased in an aluminum casting, and packed with grease. Special attention is called to the method of hardening the gears, which is one of the features of construction of the Chadwick car, and tests for hardness are exactly the same kind as employed for the crank shaft, being made by a special instrument which insures accuracy. This illustrates the care exercised in the construction of the entire car, as each part is made of suitable material for the work it has to do, and is tested accordingly. The Chadwick Co., having decided upon the policy of making the price suit the automobile, and not an automobile to suit the price, are,by this method, enabled to employ the best materials, workmanship and tests, regardless of expense.

LUBRICATION

A complete splash system of lubrication, maintained by direct shaft drive and force feed oiler, which also independently distributes oil by direct pipes to each cylinder and bearing individually, insures a positive and perfect form of lubrication. There are fourteen feeds, six to the cylinders, at points on the sides near the lower portion of the stroke; one each to the four main bearings, and one each to the three compartments of the crank case, and one to the transmission case. It is never necessary to pour oil into the crank case, as the supply for the splash system is taken care of by the oiler, which feeds any excess or surplus to the various bearings which is caught by copper rings and thrown by centrifugal force through the internal leads in the crank shaft to the surface of the crank pin bearings. The splash in the crank case is, however, an auxiliary and not the only lubricating system depended upon, for the wrist pins are hollow and receive their oil from the cylinder walls. These pins are prevented from side slipping by a neat device which is shown in the accompanying sketch. A small pin passes through the

quickly pushed by the finger out of contact with the winged nut, so the latter can be unscrewed. At the base of the magneto are dowels which register with holes in the supporting surfaces of the aluminum crank case. The magneto can be instantly changed without the use of any tools, its drive being through an Oldham coupling which separates of its own accord as the magneto is lifted out of place

THE CHAIN CASE.

The Chadwick chain case is still retained, but greatly improved. The special features of this case are that it is a thorough protection, is absolutely tight so that it can be packed with grease. The chain is easily adjusted by means of spe-

TRANSMISSION

The change speed gear mechanism is practically the same as last year and consists of an aluminum case horizantally divided, the rear portion forming a housing for the double bevel gears, the differential being to one side. The main shaft is driven direct from the engine, and is fitted with a bevel gear at the rear, mounted on annular ball bearings. At the side is a lay shaft, the rear end of which is also fitted with a bevel pinion, there being two bevel gears on the jack shaft. This allows of a direct drive on high speed, the engagement being by means of an internal gear clutch. On the intermediate speeds, the drive is through one set of spur gears and

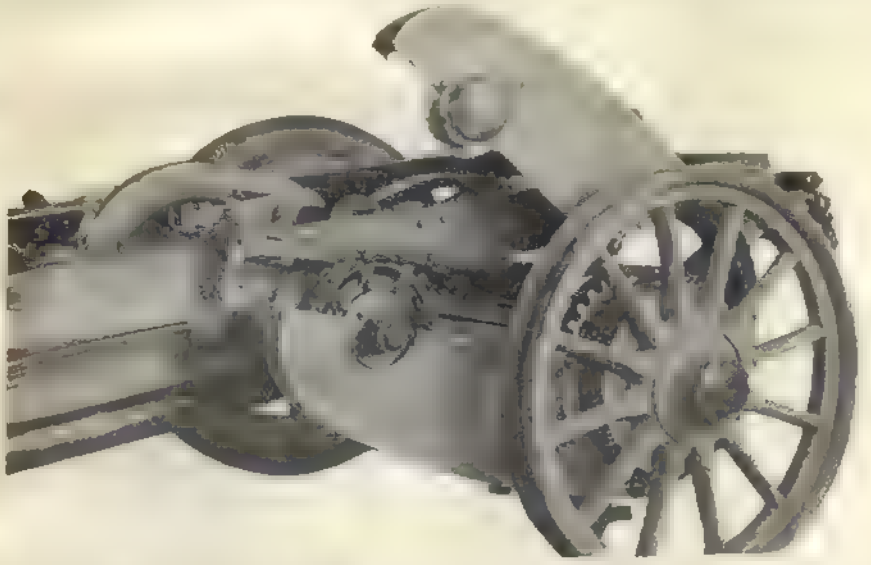


Fig. 18. The Chadwick chain case shown open. The [illegible] light chain housing is grease tight being filled with grease in which lubricant the chain operates, excluding the dirt and silencing the noise and adding long life to the chain which [illegible] has all thing [illegible] arranged that the chain adjustme t can be made without [illegible] with Ch[illegible], the jack shaft [illegible] through a slotted opening on the inside of the case, the gear be[illegible] fitted to [illegible] tight joint, thus accomplishing in a neat manner a result which has been the "hoodoo" of chain case designers for years. Attention is called to the retaining cap on the upper [illegible] of the case. This cap engages a lip on the lower half of the case and will thus retain the lower portion in position if [illegible] were nothing else to hold it in place. The cap is locked by the small spring the end of which engages the [illegible] periphery of the cap.

cial screws for this purpose at the forward end, the case moving bodily with the rear axle. A sliding joint is provided in the radius rod which supports the chain case, so that there is no leak around the jack shaft bearings. This case was described in the June, 1907, issue of the Journal, page 104. A new feature of this case is a large aluminum cap, which covers the forward sprocket hub and is prevented from unscrewing by a short, flat spring, engaging notches milled in the cap. By pressing this spring out of engagement, the cap can be quickly unscrewed. Access is thereby given to the outward bearing of the sprocket, so that it can be packed with grease, holes being provided for this purpose. The cap is also arranged to engage flanged lips of the chain case, so as to securely lock both halves of the case together.

the bevel gears at the rear, instead of two sets of spur gears and the bevels as usually used in the ordinary transmission which is not provided with double bevels at the rear. All the gears are of chrome nickel steel suitably treated. The gears are operated by a side lever on what is known as a semi-selective method, the reverse being obtained by a side motion of the gear-shifting lever, while the other speeds are obtained by its forward motion in a notched quadrant. This gear shift lever is fitted with a device which makes it impossible to go through a gear without releasing the ratchet lever at the grip. The ratchet, however, is automatically released, as the gear lever is moved forward, and snaps into the next gear shift notch of its own accord, it not being necessary for the operator to feel for the proper notch. The main driving shaft, just be-

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. | Per Doz
2606–Bone Handle, Barlow pattern, 3½ in., steel lined, steel bolster, two blade | $6.00

No. | Per Doz
2743–Ebony Handle, 3¼ in., steel lined, steel bolster, two blade... | $7.00
2764–Stag Handle, 3¾ in., steel lined, steel bolster, two blade..... | 7.50

No. | Per Doz
2101 Steel Handle, [illegible] | $7.50

No. | Per Doz
2958–Stag Handle, 3½ in., easy opener, steel lined, steel bolster, two blade... | $7.50

Full Size Cuts One-half Dozen in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

| No. | | Per Doz |
|---|---|---|
| 2758 | **Stag Handle,** 3½ in., steel lined, steel bolster, two blade | $7.50 |
| 2755 | **Cocobolo Handle,** 3½ in., steel lined, steel bolster, two blade | 7.50 |

| No. | | Per Doz |
|---|---|---|
| 2339 | **Stag Handle,** 3½ in., brass lined, German silver bolster, two blade | $7.50 |
| 2828 | **White Bone Handle,** 3½ in., steel lined, steel bolster, two blade | 7.50 |

| No. | | Per Doz |
|---|---|---|
| 250 | **Stag Handle,** 3¾ in , brass lined, German silver bolster, two blade | $8.00 |

| No. | | Per Doz |
|---|---|---|
| 2297 | **Stag Handle,** 3¾ in., brass lined, German silver bolster, two blade | $8 00 |

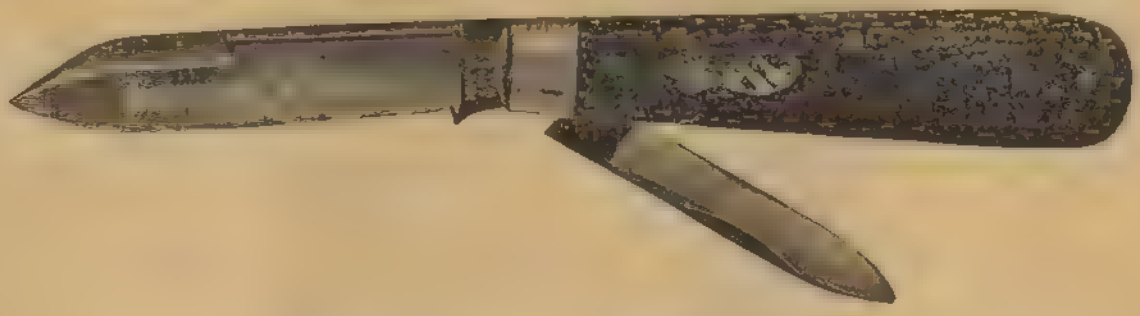
Full Size Cuts One-half Doz in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. — Per Doz.
2663–Stag Handle, [illegible] German silver bolster, two blade ..... $8 00



No. — Per Doz.
6364–Stag Handle, 3 ½ in. brass lined, German silver bolster, two blade ..... $8 00

No. — Per Doz.
6557–Stag Handle, 3½ in. brass lined, German silver bolster, two blade ..... $8 00
6556–Ebony Handle, [illegible] German Silver [illegible] two blade ..... 8 00

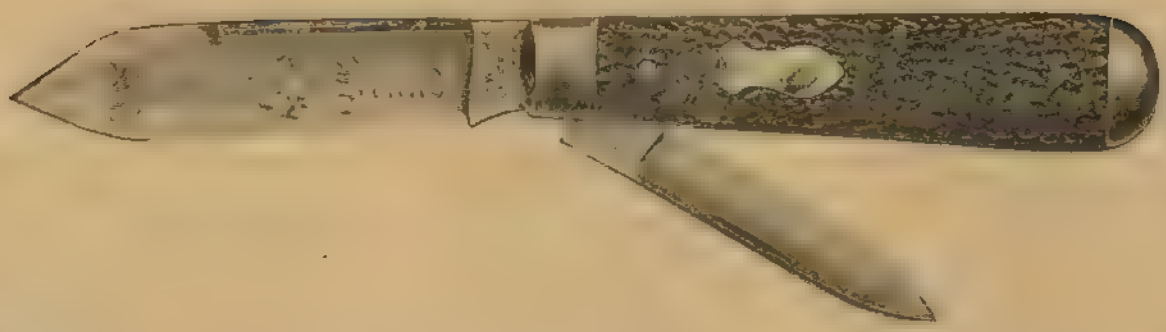
No. — Per Doz.
6030–Stag Handle, [illegible] 3½ in. brass lined, steel bolsters, two blade ..... $8 00

Full Size Cuts. One half Doz. in a Box

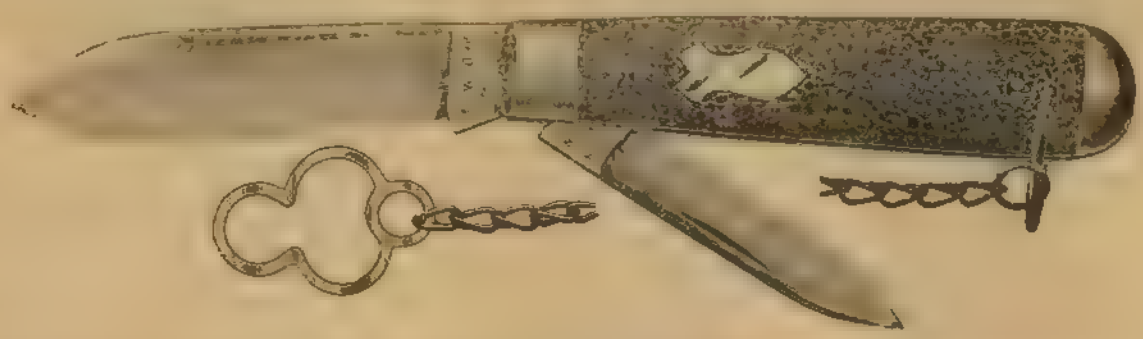
# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted



No. — Per Doz
**2957–Stag Handle,** 3¼ in., brass lined, German silver bolsters, two blade — $8 00
**626–Stag Handle,** 3½ in., brass lined, German silver bolsters, as 295[illegible] — 8 00



No. — Per Doz
**2759–Stag Handle,** 3½ in., steel lined, steel bolsters with chain, t[illegible] — $8 00

No. — Per Doz
**2335–Stag Handle,** 3¼ in., brass lined, German silver bolsters, two blade — $8 00
**2334–White Bone Handle,** 3½ in., brass lined, German silver bolsters, two blade — 8 00

No. — Per Doz
**614–Stag Handle,** 3½ in., brass lined, German silver bolsters, two blades — $8 00

Full Size Cuts. One-half Doz. in a Box

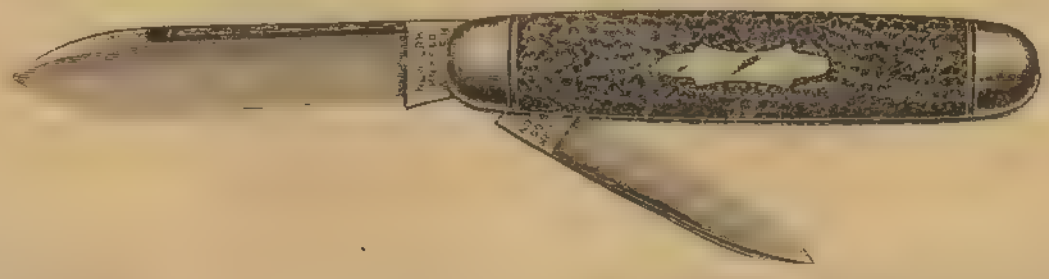
# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

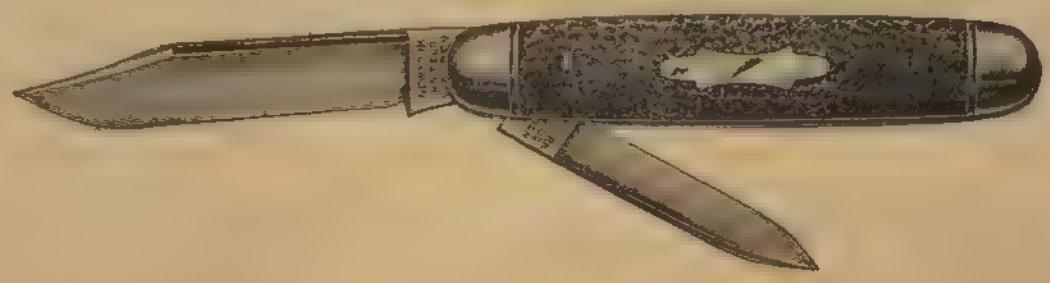
Fully Warranted

No. — Per Doz.
**2469–Stag Handle,** 3½ in., brass lined, German silver bolsters, two blade . . . . . $8.00

No. — Per Doz.
**628–Stag Handle,** 3½ in., brass lined, German silver bolsters, two blade . . . . . $8.00



No. — Per Doz.
**2423–Stag Handle,** 3¼ in., brass lined, German silver bolsters, two blade . . . . . $8.00
**2421–Ebony Handle,** 3¼ in., brass lined, German silver bolsters, two blade . . . . . 8.00



No. — Per Doz.
**6038–Stag Handle,** 3¼ in., brass lined, German silver bolsters, two blade . . . . . $8.00

Full Size Cuts, One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. | Per Doz.
6423–Stag Handle, 3¼ in. brass lined, German silver bolsters, two blade . . . $8.00

No. | Per Doz.
2360–Stag Handle, 3¼ in. brass lined, German silver bolsters, two blade . . $8.00
2358–Ebony Handle, 3¼ in. brass lined, German silver bolsters, two blade . . $8.00

No. | Per Doz.
243–Stag Handle, 3¼ in. brass lined, German silver bolsters, two blade . . $8.00

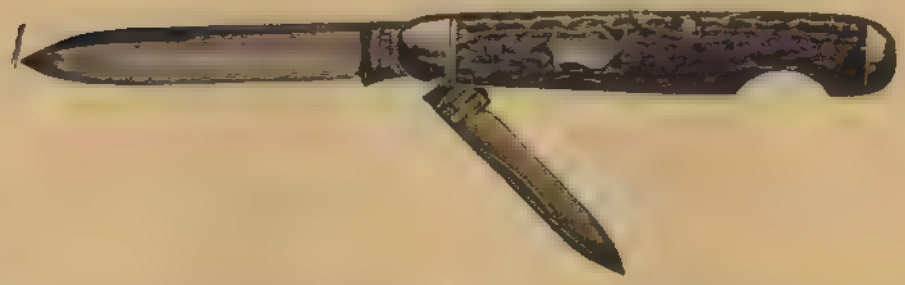
No. | Per Doz.
6165–Tortashell Handle, 3¼ in. easy opener, brass lined, German silver bolster, two blade . . $8.00
6160–Roseshell Handle, 3¼ in. easy opener, brass lined, German silver bolster, two blade . . $8.00

Full Size Cuts. One half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted



| No. | Per Doz. |
|---|---|
| **6377–Stag Handle,** easy opener, 2¾ in., brass lined, German silver bolsters, two blade | $ 8.00 |
| **6376–Buffalo Horn Handle,** easy opener, brass lined, German silver bolsters, two blade | 8.00 |

| No. | Per Doz. |
|---|---|
| **2377 Stag Handle,** 2¾ in., brass lined, German silver bolsters, two blade | $ 8.00 |
| **2376-Buffalo Horn Handle,** 2¾ in., brass lined, German silver bolsters, two blade | 8.00 |
| **6194-Perlshell Handle,** 2¾ in., brass lined, German silver bolsters, two blade | 8.00 |
| **2378–Pearl Handle,** 2¾ in., brass lined, German silver bolsters, two blade | 15.00 |

| No. | Per Doz. |
|---|---|
| **2080–Pearl Handle,** 2¼ in., brass lined, German silver bolsters, two blade | $15.00 |
| **2076–Stag Handle,** 2¼ in., brass lined, German silver bolsters, two blade | 8.00 |
| **2077 Buffalo Horn Handle,** 2¼ in., brass lined, German silver bolsters, two blade | 8.00 |

| No. | Per Doz. |
|---|---|
| **6274–Perlshell Handle,** 3 in., brass lined, German silver bolsters, two blade | $ 8.00 |

Full Size Cuts. One-half Doz. in a Box

# Pocket Knives

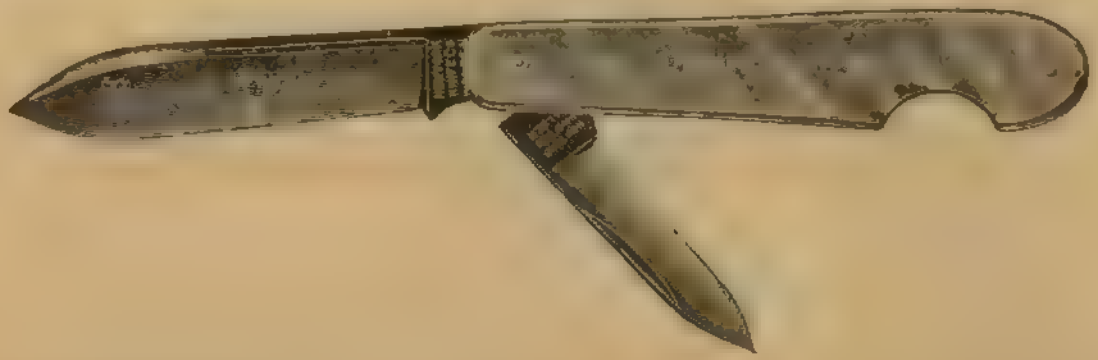
## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

| No. | | Per Doz. |
|---|---|---|
| 657 | **Stag Handle,** 3 in., brass lined, German silver bolsters, two blade | $ 8.00 |
| 658 | **Pearl Handle,** 3 in., brass lined, German silver bolsters, two blade | 18.00 |

| No. | | Per Doz. |
|---|---|---|
| 2162 | **Pearl Handle,** 3 in., brass lined, German silver bolsters, two blade | $18.00 |
| 6184 | **Perlshell Handle,** 3 in., brass lined, German silver bolsters, two blade | 8.00 |

| No. | | Per Doz. |
|---|---|---|
| 2010 | **Pearl Handle,** 2¾ in., brass lined, German silver bolsters, two blade | $12.00 |



| No. | | Per Doz. |
|---|---|---|
| 2654 | **Solid German Silver Handle** and Lining, easy opener, 3½ in., two blades | $ 8.00 |

Full Size Cuts. One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. | Per Doz
2617–Fancy Aluminum Handle, 3½ in., two blade ..... $ 9.00

No. | Per Doz
2038–Stag Handle, Baldwin ... Lamprey Line, 4 in., steel lined, German silver bolsters ..... $11.00

No. | Per Doz
200–White Celluloid Handle, ... Knife, 3¾ in., brass lined, two ... ..... $15.00

No. | Per Doz.
2229–Stag Handle, 3¾ in., brass lined, German silver bolsters, two blade ..... $9.00

Full Size Cuts, One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. 2874–Stag Handle, easy opener, 3⅛ in. brass lined German silver bolster ..... Per Doz. $10.00

No. 2591–Stag Handle, [illegible] German silver bolsters, two blade ..... Per Doz. $11.00

No. 2928–Stag Handle, [illegible] ..... Per Doz. $11.00

No. 2913–Stag Handle, 3⅛ in. brass lined, German silver bolsters, two blade ..... Per Doz. $11.00

Full Size Cuts. One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. — Per Doz.
2322 Stag Handle, 3 in. [illegible] $11.00

No. — Per Doz.
2175–Stag Handle, 3⅛ in., brass lined, German silver bolster, two blade ..... $12.00
2176–Buffalo Horn Handle, 3⅛ in., brass lined, German silver bolster, two blade. $13.00

No. — Per Doz.
2173–Dog Wood Handle, 4 in. [illegible] $12.00

No. — Per Doz.
2936–Stag Handle, 4 in., brass lined, German silver bolster, two blade. $12.00

Full Size Cuts, One-half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

All Warranted

No.
2713 Stag Handle, [illegible] Per Doz $12.00

No
2538–Stag Handle, [illegible] Per Doz $12.00

No
2789 –Stag Handle, [illegible] Per Doz. $12.00
2789½–Buffalo Horn Handle, [illegible] 9.00

No.
2808–Stag Handle, 3¾ in. brass lined German silver bolsters, two blades [illegible] Per Doz $12.00

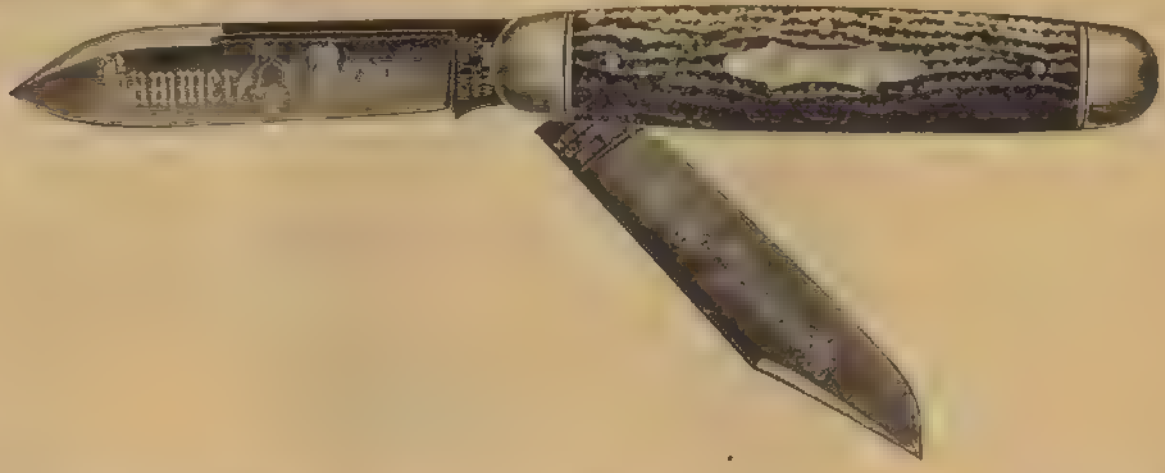
Full [illegible]

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. — Per Doz.
**2434**–Stag Handle, [illegible] brass lined, German silver bolsters, two blade . . . . . $12 00




No. — Per Doz.
**2689**–Stag Handle, 3⅝ in., brass lined, German silver bolsters, two blade . . . . . $12 00

No. — Per Doz.
**2553**–Stag Handle, 3¼ in., brass lined, German silver bolsters, two blade . . . . . $12 00
**2603** White Bone Handle, [illegible] brass lined, German silver bolsters, two blade . . . . . 13 00

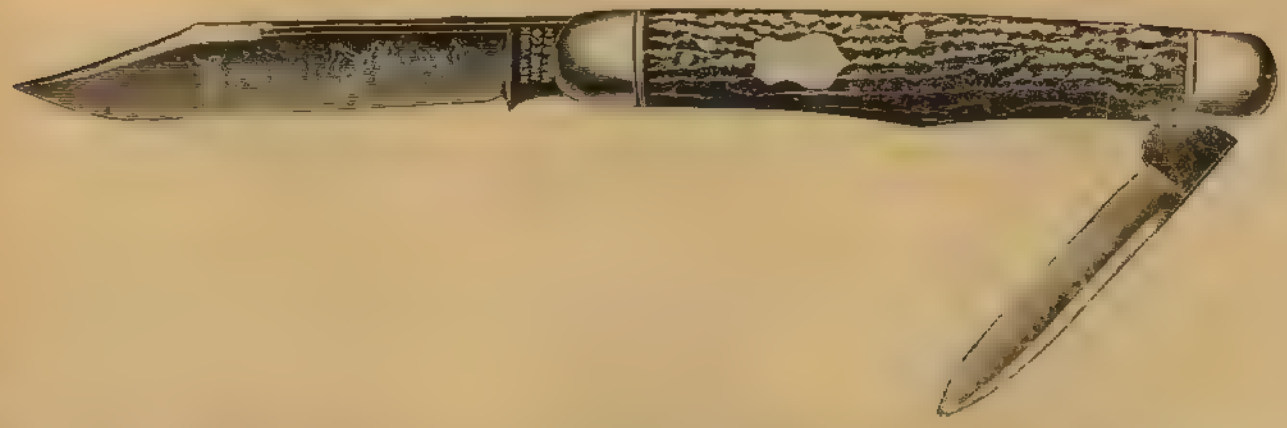
No. — Per Doz.
**22086**–Genuine Stag Handle, [illegible] in. brass lined, German silver bolsters, two blade . . . . . $13 00

Full Size Cuts, One-half Doz. in a Box

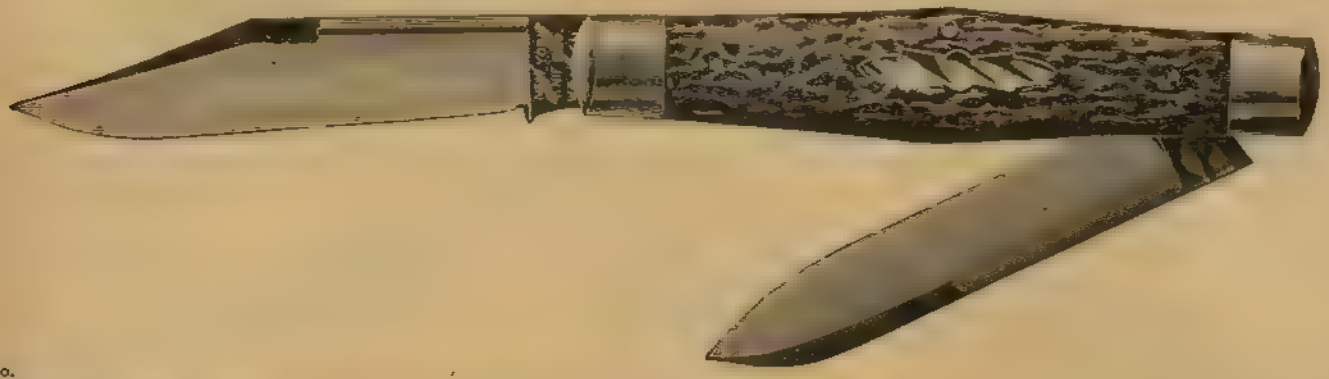
# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

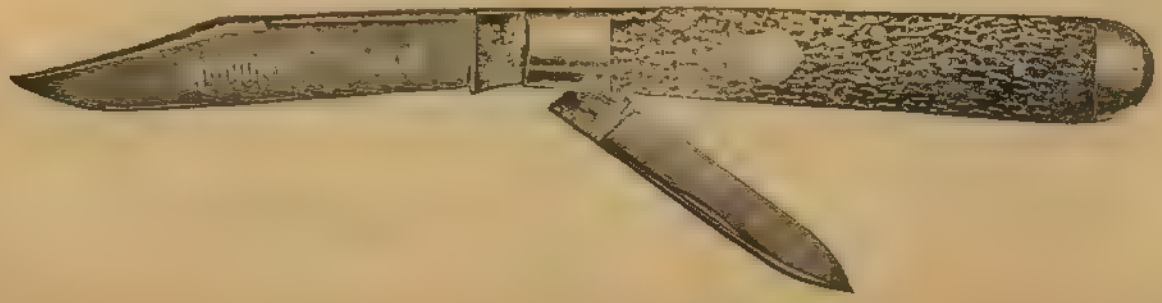


No. 2878–Stag Handle, 4 in., brass lined, German silver bolsters, two blade ..... Per Doz. $13.00



No. 2938–Stag Handle, 4 in., steel lined, steel bolsters, two blade ..... Per Doz. $12.00

No. 2944–Stag Handle, 4 in., brass lined, German silver cap and bolsters, two blade ..... Per Doz. $15.00



No. 2998–Stag Handle, (cut ¾ size) 4⅛ in., brass lined, German silver bolsters, two blade ..... Per Doz. $13.00

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

| No. | Per Doz. |
|---|---|
| **2045–Stag Handle,** 3¼ in., brass lined, two blade | $ 7 50 |
| **2047–Pearl Handle,** 3¼ in., brass lined, two blade | 21 00 |

| No. | Per Doz. |
|---|---|
| **2048–Stag Handle,** 3¼ in., brass lined, German silver tipped, two blade | $ 8.00 |
| **2150–Pearl Handle,** 3¼ in., brass lined, German silver tipped, two blade | 21.00 |

| No. | Per Doz. |
|---|---|
| **6244–Pearl Shell Handle,** 3¼ in., brass lined, German silver bolsters, two blade | $ 8 00 |
| **6246–Amber Shell,** 3¼ in., brass lined, German silver bolsters, two blade | 8 00 |
| **6242–Ivory Shell,** 3¼ in., brass lined, German silver bolsters, two blade | 8 00 |

| No. | Per Doz. |
|---|---|
| **2971–Pearl Handle,** 3 in., brass lined, German silver bolsters, two blade | $18 00 |
| **2579–Stag Handle,** 3 in., brass lined, German silver bolsters, two blade | 8.00 |

| No. | Per Doz. |
|---|---|
| **23796–Genuine Stag Handle,** 3 in., brass lined, German silver bolsters, two blade | $11 00 |
| **6253–Deer Shell Handle,** 3 in., brass lined, German silver bolsters, two blade | 8 00 |

| No. | Per Doz. |
|---|---|
| **2974–Solid German Silver Handle,** 3¼ in., two blade | $ 8 00 |

Full Size Cuts, One half Doz. in a Box

# Pocket Knives

## NEW YORK KNIFE CO. "HAMMER" BRAND

Fully Warranted

No. — Per Doz.
699–Grained Celluloid Handle, 3 in., brass lined, two blade ..... $ 8.00

No. — Per Doz.
2686–Stag Handle, 2¼ in., brass lined, German silver bolsters, two blade ..... $ 8.00

No. — Per Doz.
295–Pearl Handle, 2¼ in., brass lined, German silver bolsters, two blade ..... $12.00

No. — Per Doz.
2895–Engraved Aluminum Handle, 2¾ in., two blade ..... $ 8.00

No. — Per Doz.
2083–Pearl Handle, 2¼ in., brass lined, German silver bolster, two blade ..... $10.00
2904–Stag Handle, 2¼ in., brass lined, German silver bolsters, two blade ..... 8.00
2903–White Celluloid Handle, 2¼ in., brass lined, German silver bolsters, two blade ..... 8.00

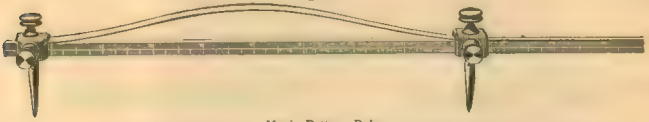
No. — Per Doz.
23556–Genuine Stag Handle, 3¼ in., brass lined, German silver bolsters, two blade ..... $12.00

No. — Per Doz.
2656–Pearl Handle, 3 in., brass lined, German silver bolsters, two blades ..... $16.00

Full Size Cuts, One-half Doz. in a Box

## TINNERS' TOOLS

Fig. 875A



### Magic Pattern Rule

The greatest Labor-Saving Tool ever invented in the interest of Tinners and Sheet-Metal Workers

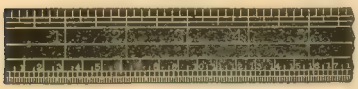
The "Magic" Pattern Rule consists of a nickel-plated steel bar 4 feet long, ¾ inch square, marked in circumference inches on the front and in inches and eighths on the back, and two slides with set-screws into which trammel points are fastened. For laying out elbow patterns the left hand slide is fastened to the end of the bar by the set-screw, and the right-hand slide is set according to the diameter elbow that is wanted. A flexible steel ribbon on the top of the bar is then raised to the required height, according to angle of elbow wanted; one glance at the chart giving such height necessary according to the elbow required.

"Magic" Pattern Rule and Chart, complete in hinged Wooden Case, each..... $5.00

"Magic" Chart only, 19 x 23 inches, mounted on Linen, each .. .. ..... .50

### Tinners' Steel Rule

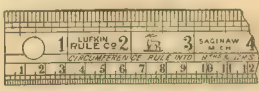
Fig. 875B



**No. 101, 3 feet, polished, each**..... $3.50
**107, 3 feet, nickel-plated, each**..... .. 4.00

### Tinners' Steel Circumference Rules

Fig. 875C




One side circumference rule; opposite side table of measurements, as follows:

Liquid Measure—Flaring, ¼ pint to 5 gallons.
Dry Measure—Flaring, ¼ bush. to 2 bush.
Cans—Pitched Top, 1 gal. to 10 gals.
Cans—Flat Top, 1 gal. to 200 gals.
Dry Measure—Straight, 1 qt. to 3 bush.

| | | 3 ft. | 4 ft. |
|---|---|---|---|
| **No. 95,** | 1½ x 16 gauge, plain, doz.. | $30.00 | $36.00 |
| | Nickeled, per dozen ..... | 36.00 | 42.00 |

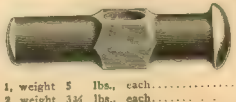
### Setting Hammer, Handled

Fig. 875D

| | | | Each | Per doz. |
|---|---|---|---|---|
| **No. 1,** | 1⅜ | inch, weight 1⅜ lbs.... | $0.82 | $9.75 |
| **2,** | 1 | inch, weight 18 oz..... | .70 | 8.31 |
| **3,** | ⅞ | inch, weight 14 oz..... | .57 | 6.75 |
| **4,** | ¾ | inch, weight 10 oz..... | .45 | 5.31 |
| **5,** | ⅝ | inch, weight 6 oz..... | .40 | 4.75 |

### Raising Hammer, Handled

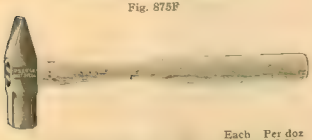
Fig. 875E



**No. 1,** weight 5 lbs., each..... $2.35
**2,** weight 3¾ lbs., each..... 1.85
**3,** weight 2¼ lbs., each..... 1.35
**4,** weight 1¼ lbs., each..... .85
Handles, per doz., extra..... 1.25

### Riveting Hammer, Handled

Fig. 875F



| | | | Each | Per doz |
|---|---|---|---|---|
| **No. 0,** | 1½ | inch, weight 2½ lbs | $1.30 | $15.50 |
| **1,** | 1⅜ | inch, weight 1½ lbs.... | .82 | 9.75 |
| **2,** | 1 | inch, weight 18 oz..... | .70 | 8.31 |
| **3,** | ⅞ | inch, weight 14 oz..... | .57 | 6.75 |
| **4,** | ¾ | inch, weight 10 oz..... | .45 | 5.31 |
| **5,** | ⅝ | inch, weight 6 oz..... | .40 | 4.75 |

### Planishing Hammer

Fig. 875G

**All sizes and weights, per lb**..... $1.00

# TINNERS' TOOLS

## Hollow Punches

Fig. 876A

Fig. 876B

**Forged Steel** — **Wrought Shank**

All sizes to and including 1¾ inch diameter, round, per inch .....$1.00
All sizes above 1¾ inch diameter, round, per inch ..... 1.25
Oval, per inch ..... 1.50

All sizes to and including 1½ inch are forged steel. Sizes larger than 1½ inch are wrought shank.

**Special Hollow Punches.**

We make all sizes, shapes and kinds for cutting sheet metal, strawboard, paper, etc. Prices for same will be given upon receipt of a sample showing style and material from which it is to be cut.

Prick Punch
Fig. 876C

Square Cast Steel, each.....$0.12

Solid Punch
Fig. 876D

| Nos. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| Square Cast Steel, each | $0.12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |

Lantern Chisels
Fig. 876E

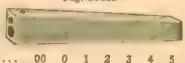
Wire Chisels
Fig. 876F

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lantern Chisels, Solid Cast Steel, each | | | | | | | | | | | | | $0.12 |
| Inches | ¼ | ⅜ | ½ | ⅝ | ¾ | ⅞ | 1 | 1⅛ | 1¼ | 1⅜ | 1½ | 1¾ | 2 |
| Wire Chisels | $0.08 | 0.09 | 0.10 | 0.11 | 0.12 | 0.13 | 0.14 | 0.15 | 0.17 | 0.19 | 0.20 | 0.24 | 0.29 |

Hand Groover
Fig. 876G

| No. | 00 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| Groove | 1/16 | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 | 9/16 | 5/8 |
| Each | $0.75 | .75 | .63 | .63 | .50 | .50 | .37 | .37 | .25 | .25 |

Rivet Sets and Headers
Fig. 876H

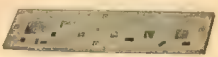


| Nos. | 00 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| Each | $0.75 | .75 | .63 | .63 | .50 | .50 | .37 | .37 | .32 | .32 |

Scratch Awl
Fig. 876 I

No. 1 Steel, length 8½ inch, per dozen.....$1.25

Bench Plates
Fig. 876J



No. 0, 48 x 12 inches, weight 94 pounds, each..$9.00
1, 37 x 8 inches, weight 50 pounds, each.. 5.00
2, 30 x 8 inches, weight 37 pounds, each.. 3.00

Improved Bend Plates
Fig. 876K

No. 3, 9 x 9 inches, weight 18 pounds, each....$3.50

Continuous Rolling Cutting Shears
Fig. 876L

No. 11, Will cut No. 20 iron, each. .....$5.00
12, Will cut No. 16 iron, each..... 7.50

## TINNERS' STAKES

**Needle Case**
Fig. 877A

Flat end 8 inches, round end 10¼ inches, weight 4 pounds, each.....$2.25

**Candle Mould**
Fig. 877C

Small end 18 inches, Horn 8¼ inches, weight 6½ pounds, each.....$2.75

**Creasing With Horn**
Fig. 877E

Round end 9½ inches, flat end 6¼ inches, weight 12½ pounds, each.....$4.50

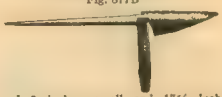
**Beakhorn**
Fig. 877G

No. 1, Flat end 21 inches, round end 19 inches, weight 45 pounds, each.....$15.00
2, Flat end 20 inches, round end 18 inches, weight 40 pounds, each..... 13.25
4, Flat end 18 inches, round end 16 inches, weight 30 pounds, each..... 10.00

**Tea-kettle**
Fig. 877I

Wrought iron, 4 steel heads, weight 45 pounds, each.....$15.75

**Common Blowhorn**
Fig. 877B



Large end 9 inches, small end 17¾ inches, weight 19 pounds, each.....$5.00

**Common Creasing**
Fig. 877D

Length 14½ inches, weight 12½ lbs., each.....$4.00

**Conductor**
Fig. 877F

No. 0, Large end 14 inches, small end 14 inches, weight 27 pounds, each.....$6.00
1, Large end 15 inches, small end 11½ inches, weight 35 pounds, each..... 4.00
2, Large end 14 inches, small end 10 inches, weight 25 pounds, each..... 3.00

**Double Seaming**
Fig. 877H

No. 1, Large end 17 inches, small end 12 inches, weight 34 pounds, each.....$9.00
2, Large end 11 inches, small end 11 inches, weight 29 pounds, each..... 8.00

**Double Seaming**
Fig. 877J

Four heads, weight 85 pounds, each.....$9.00

# TINNERS' STAKES AND SWEDGES

**Mandrel**
Fig. 878A

**No. 00,** Length to standard 60 inches, weight 128 pounds, each ..... $10.00
**0,** Length to standard 40 inches, weight 87 pounds, each ..... 6.00
**1,** Length to standard 34 inches, weight 44 pounds, each ..... 5.00
**2,** Length to standard 30 inches, weight 37 pounds, each ..... 4.00
**3,** Length to standard 27 inches, weight 31 pounds, each ..... 3.00

**Bottom**
Fig. 878C

**No. 1,** Width 1¾ inches, weight 4 lb., each....$1.00
**2,** Width 1½ inches, weight 3 lbs., each. . . .80

**Hollow Mandrel**
Fig. 878E

Length 40 inches, weight 45 lbs., each.....$5.50

**Round Head**
Fig. 878G

Weight 11 lbs., each.....$1.25

**Bevel Edge Square**
Fig. 878 I

**No. 1,** Face 3 x 5 inches, weight 15 lbs., each..$6.00
**2,** Face 2½ x 4½ inches, weight 13 lbs., each ..... 5.00

**Square Pan Swedge**
Fig. 878K

**Bath Tub**
Fig. 878B

Weight 12 lbs., each..... $4.25

**Coppersmith's**
Fig. 878D

Face 2⅝ x 4½ inches, weight 11 lbs., each.....$3.50

**Commou Square**
Fig. 878F

Face 2⅝ x 4½ inches, weight 11 lbs., each.....$3.00

**Hatchet**
Fig. 878H

**No. 1,** Blade 16″ long, weight 14 lbs., each..$5.00
**2,** Blade 14½″ long, weight 12 lbs., each.. 4.25
**3,** Blade 13″ long, weight 9 lbs., each.. 3.50
**4,** Blade 11″ long, weight 6 lbs., each.. 2.75
**5,** Blade 9″ long, weight 4 lbs., each.. 2.25
**6,** Blade 7″ long, weight 3 lbs., each.. 1.75

**Creasing Swedge—Extra Head**
Fig. 878J

**Cullender Swedge**
Fig. 878L

**Creasing Swedge**
Fig. 878M

Each .....$5.00
Gauge bolt and nut ..... .50

Each . . . . . .....$4.75

With extra head, each.....$5.00

## TINNERS' MACHINES

**Square Pan Turner**
Fig. 879A

**No. 1,** 20 inches, steel blades, each.....$2.50
**2,** 15 inches, steel blades, each.... 2.00

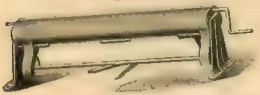
**Iron-bottom Gutter Beader**
Fig. 879B

**No. 11,** 20", steel rods, 1/8 to 1/4" diam., each..$4.00
**12,** 15", steel rods, 1/8 to 1/4" diam., each.. 3.50

**Gutter Beader Rods**
Fig. 879C

**No. 11,** 20" long, 1/8 to 1/4" diam., each.....$2.00
**12,** 15" long, 1/8 to 1/4" diam., each.. 1.75

**Stow's Patent Gutter Beader**
Fig. 879D

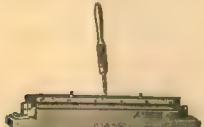


**No. 1,** 20", steel rods 1/8 to 3/16" diam, each $5.50
**2,** 15", steel rods 1/8 to 1/4" diam, each.. 4.50

**Iron Bottom Sheet Iron Folder**
Fig. 879E

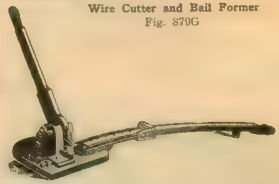
Length 30 inches, will turn locks 1/8 to 1/4 inch, weight 53 lbs., each.....$7.00

**Wood Bottom Sheet Iron Folder**
Fig. 879F



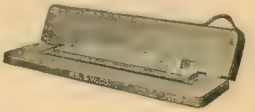
Length 30 inches, will turn locks 1/8 to 1/4 inch, weight 56 lbs., each.....$10.00

**Wire Cutter and Bail Former**
Fig. 879G



Van Bramer's, weight 30 lbs., each. .$10.00

**Wood Roofing Folder**
Fig. 879H



**No. 1,** Common, 30" without gauge, each. $3.50
**2,** Improved, 30", with gauge, each.. 5.00

**Wright's Patent Sheet Iron Folder**
Fig. 879 I

No. 1, 30 inches, weight 64 lbs., will turn locks from 1/8 to 1/4 inch, each.....$12.00

**Wright's Improved Sheet Iron Folder**
Fig 879 J

No. 12, 30 inches, weight 69 lbs., will turn locks 1/8, 3/16, 1/4 and 5/16 inch, each ..$15.00

# TINNERS' TOOLS

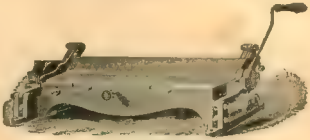
**Stow's Patent Adjustable Bar Folder**

Fig. 880A

**No. 52,** 20 inches, will turn locks 1/8 to 1 inch, weight 80 lbs., each.....$30.00
**54,** 30 inches, will turn locks 1/8 to 1 inch, weight 155 lbs., each..... 40.00

**Stow's Patent Adjustable Bar Folder**

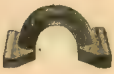
Fig. 880B



**No. 152,** 20 inches, will turn locks 1/8 to 1 inch, weight 80 lbs.....$30.00
**154,** 30 inches, will turn locks 1/8 to 1 inch, weight 155 lbs..... 40.00

**Roofing Double Seamers**

Fig. 880C



Size, inches ....1/2 x 3/4, 3/4 x 1, 1 x 1 1/4, 1 1/4 x 1 1/2
Per set of 2 pairs.....$1.75

**Heberling's Roofing Double Seamers**

Fig. 880D

Weight 24 lbs., per pair.....$16.00

**Common Roofing Tongs**

Fig. 880E

Size, inches, 1/2, 3/4, 1, 1 1/4, 1 1/2, 1 3/4
Per set of 2 pairs.....$6.00

**Improved Roofing Tongs**

Fig. 880G

Per pair .....$4.00

**Gutter Tongs**

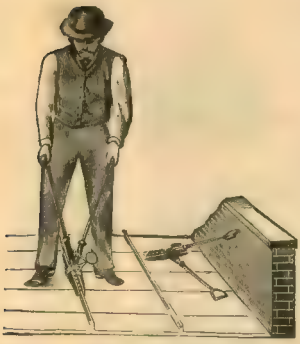
Fig 880F

Per pair .....$5.00

## TINNERS' TOOLS

### Burritt's Roofing Double-Seamers

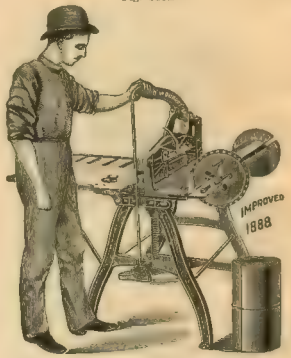
Fig. 881A



Burritt's Roofing Double-Seamers, for Tin Roofing, per set of 2 pairs ..... $30.00
Common Gauge, adapted to 1 x 1¼ inch Tongs.
Wide Gauge, adapted to 1¼ x 1½ inch Tongs.

### Burritt's Cross Lock-Seamers

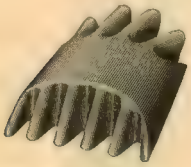
Fig. 881B




Burritt's Cross Lock-Seamers, 20 inches ..... Each, $44.00
Burritt's Cross Lock-Seamers, 28 inches ..... Each, 52.00
For fastening together Tin Strips for Roofing, and forming the Roll ready to lay on the roof.

### Bishop's Quick Working Forms

Fig. 881C



The Tool

Fig. 881D

The Work

For closing end of Eave Trough in corrugations, as shown herewith.

You can close an end much quicker, neater and cheaper than in any other way. When you cut a trough, you can put an end in both parts, thus making no waste.

The frost will not burst the end out. You can close old work from a ladder.

The form is made in five sizes, 3½, 4, 4½, 5 and 6.

| | Size, | 3½ | 4 | 4½ | 5 | 6 |
|---|---|---|---|---|---|---|
| Bishop's Quick Working Forms..... | Each, | $0.50 | .60 | .65 | .75 | 1.00 |

## TINNERS' MACHINES

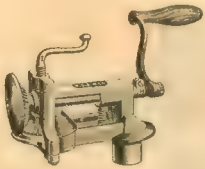
### Wiring Machine

Fig. 882A

Columbian Wiring Machine
With Stand ..... Each, $12.00
Without Stand ..... " 11.25

### Setting Down Machine

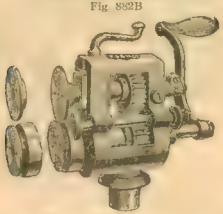
Fig 882D



Columbian Setting Down Machine
With Stand ..... Each, $9.75
Without Stand ..... " 9.00

### Large Turning Machine

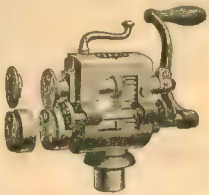
Fig. 882B



Columbian, Extra Upper and Lower Face
With Stand ..... Each, $10.25
Without Stand ..... " 9.50

### Small Turning Machine

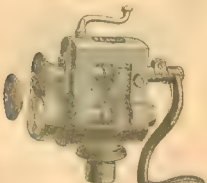
Fig. 882E



Columbian, Extra Upper and Lower Face
With Stand ..... Each, $10.00
Without Stand ..... " 9.25

### Large Burring Machine

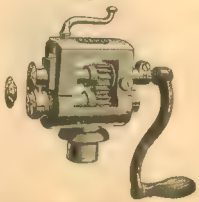
Fig. 882C



Columbian, Extra Upper Face
With Stand ..... Each, $9.00
Without Stand ..... " 8.25

### Small Burring Machine

Fig. 882F

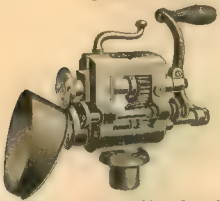


Columbian, Extra Upper Face
With Stand ..... Each, $8.50
Without Stand ..... " 7.75

# TINNERS' MACHINES

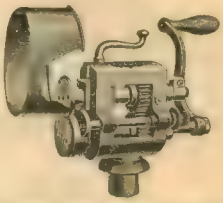
## Elbow Edging Machine

Fig. 883A



The above cut shows the position of an elbow in turning the edge; also the form of crease made by the machine to enter the corresponding section in completing the elbow.

Fig. 883B

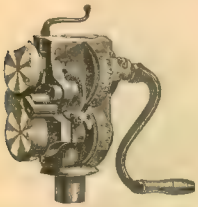


The above cut shows the position of the pipe or elbow in forming the head to receive the creased section, as shown in the illustration at the left.

Columbian Elbow Edging Machine, with Stand.....$10.50

## Encased Wiring Machine

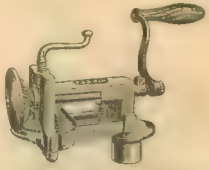
Fig. 883C



Encased wiring, with standard, each.....$14.00
Encased wiring, without standard..... 13.25

## Setting Down Machine

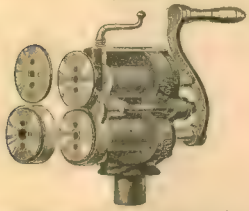
Fig. 883D



American Setting Down Machine, with standard, each $9.75
American Setting Down Machine, without standard, each

## Large Turning Machine

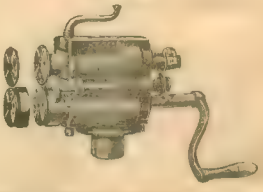
Fig. 883E



Encased Turning, extra upper and lower face with standard, each .....$11.50
Encased Turning, extra upper and lower face without standard, each ..... 10.75

## Small Turning Machine

Fig. 883F



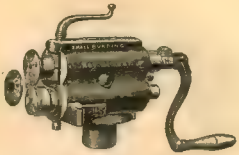
Encased Turning Machine, with
with stand
Encased Turning, extra upper and lower face without stand

## TINNERS' MACHINES

**Large Burring Machine**
Fig. 884A

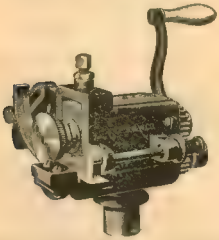
Encased, Extra Upper Face
With Stand .....Each, $10.50
Without Stand ..... " 9.75

**Small Burring Machine**
Fig. 884D



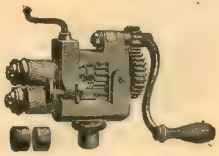
Encased, Extra Upper Face
With Stand .....Each, $10.00
Without Stand ..... " 9.25

**Stow's Patent Rim Machine**
Fig. 884B



With Stand, weight 18 lbs.....Each, $17.50

**Stove Pipe Crimper and Beader**
Fig. 884E



With Spiral Crimping and Beading Rolls, weight 45 lbs., with Stand, Each, $12.00

**Stow's Patent Beading Machine**
Fig. 884C

Rotary Stand, 3 Pairs Rollers
**No. 1.** 13 in., weight 117 lbs. Each, $32.25
**No. 2.** 10 in., weight 110 lbs.. " 31.25
**No. 3.** 7½ in., weight 81 lbs.. " 26.25

**Stow's Patent Beading Machine**
Fig. 884F

Rotary Stand, 4 Pairs Rollers
**No. 4.** 6 in., weight 35 lbs... Each, $19.75
Rotary Stand, 5 Pairs Rollers
**No. 5.** 4 in., weight 20 lbs....Each, $16.75

# TINNERS' MACHINES

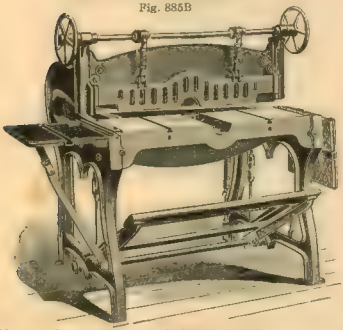
**Hull's Acme Squaring Shears**

Fig. 885A

**No. 0,** Will cut tin 22 inches long, each.....$35.00
1, Will cut tin 25 inches long, each..... 45.00
2, Will cut No. 18 iron 31 inches long, each ..... 50.00

**Continuous Cutting or Gap Shears**
With Hold-down Attachment

Fig. 885B



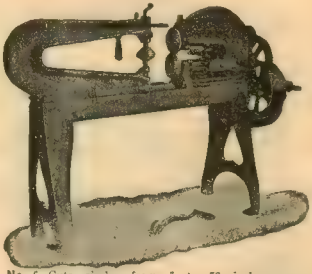
**No. 85** Foot power, 30 inches, 15 inch throat, will cut No. 16 iron, weight 1275 lbs., each .....$150.00
88 Foot power, 37 inches, 18 inch throat, will cut No. 16 iron, weight 1450 lbs., each ..... 175.00
185 For power, 30 inches, 15 inch throat, will cut No 16 iron, weight 1700 lbs., each ..... 225.00

**Waugh's Squaring Attachment**

Fig. 885C

**Waugh's Patent Bevel, Square and Circular Shears**

Fig. 885D



**No. 5,** Cuts straight from 5 to 30 inches, weight 650 lbs. .....$175.00
5, Cuts circles from 5 to 40 inches, weight 700 lbs. ..... 190.00
Extra cutter for No. 5, per pair..... 16.00

**Stow's Squaring Shears**

Fig. 885E

**No. 30,** Will cut No. 18 iron, 31 inches long, each .....$50.00

Extension Tables not included in above price.

**Waugh's Patent Bevel, Square and Circular Shears**

Fig. 885F

**No. 1,** Will cut circles, from tin, 2¼ to 15 inches, weight 60 lbs., each.....$33.00
1, With squaring attachment, weight 70 lbs., each ..... 43.00

# TINNERS' MACHINES

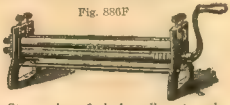
**Patent Slip Roll Stove Pipe Formers, With Compensation Gear**

Fig. 886B

**No. 100,** 2 inch rolls 30 inches long, weight 125 lbs., each ..... $22.00
200, 1¾ inch rolls 30 inches long, weight 116 lbs., each ..... 20.00
101, 1½ inch rolls 20 inches long, weight 50 lbs., each ..... 12.00
102, 1¼ inch rolls 16 inches long, weight 45 lbs., each ..... 11.00

**Stow's Patent Stove and Tin Pipe Former**

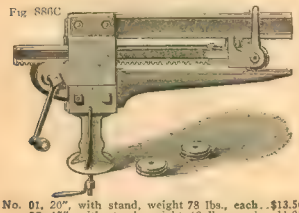
Fig. 886F



**No. 1** Stove pipe, 2 inch rolls 30 inches long, weight 130 lbs., each..... $19.00
**2** Stove pipe, 1¾ inch rolls 30 inches long, weight 105 lbs., each..... 18.00
**31** Tin pipe, 1½ inch rolls 20 inches long, weight 54 lbs., each ..... 10.00
**32** Tin pipe, 1½ inch rolls 16 inches long, weight 46 lbs., each ..... 9.00
**35** Tin pipe, 1 inch rolls 12 inches long, weight 34 lbs., each..... 12.00

**Patent Brass Mounted Groover**

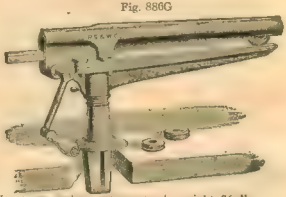
Fig. 886C



**No. 01,** 20", with stand, weight 78 lbs., each..$13.50
**02,** 17", with stand, weight 69 lbs., each.. 11.00

**Stow's Encased Groover**

Fig. 886G



No. 1, 30 inches, rotary stand, weight 76 lbs., each ..... $13.50
**2,** 17 inches, rotary stand, weight 64 lbs., each ..... 11.00

**Improved Patent Grooving Machine**

Fig. 886D

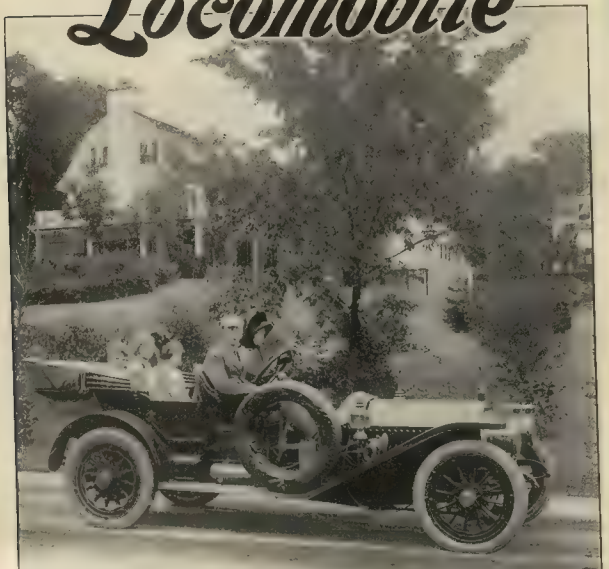
**No. 110,** 20 inches, rolls 1/16, 3/32 and ¼ inch, weight 95 lbs., each..... $13.50
120, 30 inches, rolls 3/32, ¼ and ⅛ inch, weight 110 lbs., each..... 18.00

**Groover**

Fig. 886H

**No. 40,** Wrought horn to fasten on bench, ea..$30.00
**50,** Cast horn to fasten on bench, each... 28.00

# The "30" Locomobile



"30" Shaft Drive 1910 "40" Chain Drive

The Locomobile Co. of America

Bridgeport Conn.

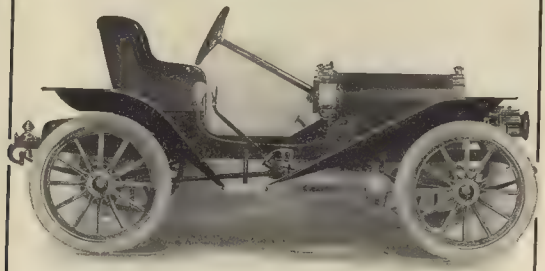
NEW YORK BOSTON CHICAGO
PHILADELPHIA SAN FRANCISCO

MEMBER ASSOCIATION LICENSED AUTOMOBILE MFRS.

# HERE IT IS

# "DEMŌT"

All of the best features of the high-priced cars embodied in a runabout at a price within reach of all.



## $550—Magneto Included

*Write for Agency Proposition*

DEMOTCAR SALES CO.
Distributers
45 State Street
DETROIT

**Demotcar Company**
Manufacturers
MICHIGAN

*Not An Assembled Car*

# The American Simplex

**Fifty Horse-power Valveless, Two-Cycle Motor runs with the smooth rhythm and applies power with the constancy of the Electric Motor**

Seven Passenger Touring Car. 50 H. P., Four-Cylinder, Valveless, Two-Cycle Motor

THE day is inevitable when the two-cycle gas engine will be the only type used in motor cars.

¶ We have recognized the virtues of the two-cycle principle—pioneers among manufacturers of high-grade, high-powered cars.

¶ Every manufacturer who puts into his car a six-cylinder engine admits the vital deficiency of the four-cycle principle—intermittent power—and his inability to overcome it.

¶ Multiplicity of cylinders merely approaches—never attains—constant turning power—the continuous torque you hear so much about.

¶ The American Simplex valveless two-cycle engine applies power with the constancy of the electric motor.

¶ There is not a valve, spring, roller, cam or camshaft on the American Simplex two-cycle engine. They would be superfluous. They hinder the four-cycle from generating its power in a steady, unceasing rush—yet the four-cycle engine cannot be built without them.

¶ The American Simplex is manufactured in our own plant in its entirety—motor, transmission, differential, gears, frame—every part where strength or harmonious action is vital to the long life of the car and the smoothness with which its motor runs.

¶ That is the reason the American Simplex is a motor car symphony—it has that complete harmonization of parts which no assembled car can have.

¶ Our 1910 literature tells of the flexible, three-point motor suspension; flexible radiator attachment; the rear axle transmission; the interlocking device on the gears; the improved torsion tube; the everlasting brake adjustment—every one a feature exclusive in the American Simplex—together with a comprehensive explanation of the differences between the American Simplex valveless, two-cycle motor and all four-cycle motors

¶ Write for it.

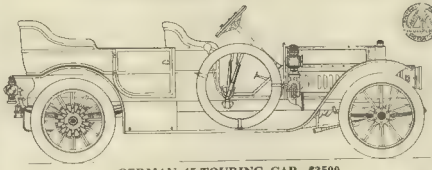
**SIMPLEX MOTOR CAR COMPANY, Mishawaka, Ind.**

Member A. M. C. M. A.

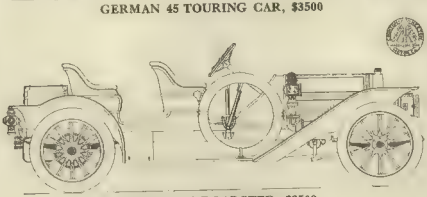
# Croxton-Keeton Cars

## For 1910

## "German 45" Types



GERMAN 45 TOURING CAR, $3500



GERMAN 45 ROADSTER, $3500

Each model has 45 H. P., 4 cylinder vertical engine. Dual ignition system, with Bosch High Tension Magneto. Selective sliding gear transmission. Three speeds forward and reverse. Wheel base, 130". 36" wheels. Tires, 4" front and 4½" rear—any standard make. Furnished with 7-passenger touring body, $3500; 5-passenger, close coupled, $3500; 3 or 4 passenger roadster, $3500; 7-passenger limousine, $4000.

Our line also includes the French 30 models—4-passenger suburban, $2850; 6-passenger touring car, $3250; landaulet, $3300; brougham, $3500.

**DEALERS** don't close for your 1910 cars without first thoroughly investigating the **CROXTON-KEETON** line, and getting our proposition.

## The Croxton-Keeton Motor Co.

### Massillon, Ohio

NEW YORK
1662 Broadway
PROVIDENCE
430 Broad St.

PITTSBURGH
5920 Baum St.
TOLEDO
233-7 Ontario St.
CHICAGO, Michigan Ave. and 21st St.

CLEVELAND
2174 E. 9th St.
KANSAS CITY
425 Delaware St.

**For Actual Road Service the Ideal Equipment——**

# "Firestone"

## TIRES and DEMOUNTABLE RIMS

**(Quick Detachable and Clincher)**

The Tires least likely of all to need changing; with the quickest and easiest means of tire changing when it is required.

Firestone Demountable Rims, like Firestone Tires, represent the highest degree of efficiency, in the supreme test of **actual service.**

**Send for book on Demountable Rims and the name of nearest dealer demonstrating them.**

# FIRESTONE TIRE & RUBBER CO.

"America's Largest Exclusive Tire Makers"

**AKRON, OHIO**

and Everywhere Else

# Write for Our Advance 1910 Catalogue and Booklet—"*The Story of the Glidden Tour and the Moline's Perfect Road Score.*"

THE FINEST $1500.00 CAR ON THE MARKET

WE want you to read the phenomenal performance the Moline made, day by day, in this, the toughest endurance contest ever undertaken.

We want you to see how the Moline out-roaded, out-scored cars costing double its modest price.

We want you to get a practical, trustworthy idea of the actual serviceability, durability and efficiency of the Moline, for we feel that the Glidden Tour affords the buyer of an automobile with buying information that is far better than any demonstration one can get in the ordinary way of buying.

Here are a few points we call to your particular attention:

**The Moline covered the 2640 miles of this tour without a single displacement or hitch in any way whatsoever.**

**The Moline was the lowest priced car that made a perfect road score of the entire tour.**

**The Moline was the only car in the entire tour which carried no extra parts.**

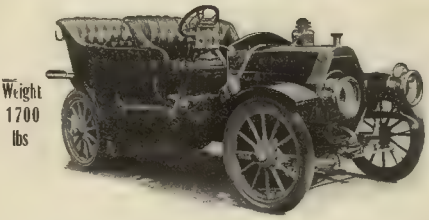
While this does not tell the detail performance of the dependable Moline, yet in brief it tells a record of **actual road service, durability and dependability** superior to any of the contesting cars regardless of their cost, some of which sell for more than double the price of a Moline.

If you are looking for down-right merit, **proven efficiency** under the severest test; if you are looking for a car that is smart, classy, luxurious—that will give you the utmost satisfaction, the Moline will "Make Good," to the fullest degree—and the cost will be less than half, for the Moline Model "M" 1910 sells for only $1500 with full equipment.

It will certainly pay to look into the Moline before you buy. Ask for Advance Catalogue No. 37. Send today.

**MOLINE AUTOMOBILE COMPANY, East Moline, Illinois**

# CAR AHEAD!




## RIDER-LEWIS "FOUR"

### The Biggest Little Car Ever Built

¶ In design, appearance and ability, the Rider-Lewis IV easily heads the list of popular priced cars.

**FEATURES:**

| | |
|---|---|
| Four Cylinders | Flexible Motor Supports |
| Valves in the Head | Rear Axle Gear Set, 3 Speeds |
| Magneto Ignition | Straight Line Drive |
| Thermo-Syphon Cooling | Light Weight |
| 32″ x 3½″ Tires | 100″ Wheel Base |

**—Simplicity the Very Keynote of the Design—**

**WE ALSO MANUFACTURE THE EXCELLENT SIX**

**(The Most Luxurious of Cars), Price. $2500**

**CATALOG ON REQUEST. AGENTS GET OUR PROPOSITION**

**Price, $1050** **The Rider-Lewis Motor Car Co.**

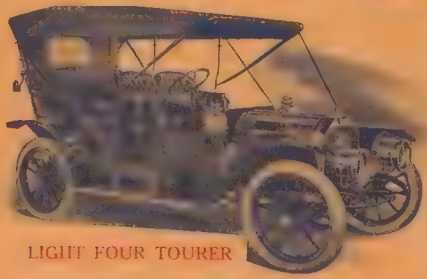
(Fully equipped with Remy Magneto and full lamp equipment)

Anderson, Indiana

**Eastern Distributor:—H. J. Koehler Sporting Goods Co.,** 1709 Broadway, New York City

LIGHT FOUR RACYTYPE
(3 or 4 PASSENGER)

LIGHT FOUR ROADSTER
(SMALL TONNEAU)



LIGHT FOUR TOURER

# 1910 MODEL—INVESTIGATE

Mora Company, 37 MORA PLACE, Newark, N. Y.

NEW YORK BRANCH
Br[illegible] & 52[illegible]

CHICAGO AGENTS:
[illegible]

# Announcement

## To Agents of High Class Cars

## The Pierce 30 for 1910=$1750

¶ This car is intended for those who are thinking of paying from $3000 to $4000 for a strictly high-grade car but who are either not ready to pay that price or who are not fully convinced of the need of it.

¶ In this PIERCE 30 the chassis, the springs, the body, the wheels, the furnishings and the accessories all are of the grade that is only found (if at all) in a few of the highest priced cars on the market.

¶ There is not only refinement in both appearance and style, but this refinement is **substantial** and not of the **superficial** soon-wear-off variety.

¶ Agents will know that the demand for cars of this character, at a **fair** price, is greatly in excess of the supply.

¶ The PIERCE 30 is made at Racine, Wisconsin, by the Pierce Motor Company, and was designed by A. G. Pierce, internationally known as the designer and manufacturer of the famous PIERCE engines. The engine Mr. Pierce has built for this 1910 car is one of the most quiet-running, simple and powerful 30-horse power engines ever put into an American or foreign car.

### *Guaranteed for One Year*

¶ The PIERCE is the only car on the market that is covered by a **full year's** guarantee against defective parts, which is the best possible proof of its superior quality.

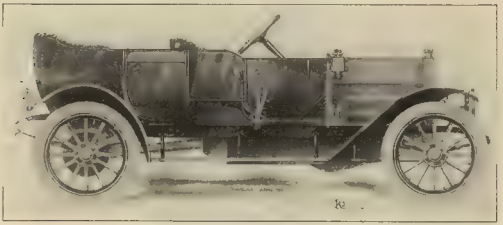
¶ Only a few of these cars will be made for 1910 and agents who are interested are requested to write or wire us immediately.

**PIERCE MOTOR COMPANY**

**RACINE, WISCONSIN**

*MANUFACTURERS OF ENGINES FOR OVER 25 YEARS AND OF AUTOMOBILES FOR OVER 15 YEARS*

# KOEHLER "40"



## $1650.00

### Specifications:

MOTOR—4 cylinders, 4 cycle, 4½ bore by 5 stroke, water cooled.
IGNITION—Magneto and battery
LUBRICATION—Splash system with mechanical oil pump, gear driven. Oil reservoir integral with crank case.
VALVES—Mechanically operated from one cam shaft. Cams integral with shaft. All points of contact in connection with valve movement, hardened.
COOLING—Radiator, and gear driven centrifugal pump. Ball bearing fan driven by 1" flat belt from crank shaft. Fan attached to engine. Adjustable
CONTROL—Spark and throttle levers on top of steering wheel. Segment stationary and independent of wheel. Foot accelerator works in conjunction with hand throttle.
STEERING WHEEL—19 inches.
MUFFLER—Scientifically designed, eliminating back pressure. Exhaust pipe diameter increases between first and fourth cylinders. Equipped with cut-out at front end, giving direct exhaust.
TRANSMISSION—Sliding gear, selective type, three speeds forward, one reverse. Operating lever in H quadrant, roller bearings.
DRIVE—Shaft drive.
CLUTCH—Cone type, composition face, with springs underneath to insure smoothness of engagement. Not affected by oil or water.
REAR AXLE—Most improved type with extra large driving gears to insure wear. Entire axle generously proportioned. Ball thrusts.
FRONT AXLE—Single piece, drop forged, special steel "I" beam section.
FRAME—Pressed steel, channel section with subframe, narrowed in front to permit of short turns.
WHEEL BASE—112 inches.
TREAD—56 inches.
WHEELS—34" Artillery type, large spokes. Q. D. Rims
SPRINGS—Front spring, 48" semi-elliptic. Rear, 52" 3 scroll elliptic.
BRAKES—Two separate systems. One over external, operated on pressed steel drum, the other, internal expanding. Adjustment accessible and alignment perfect
BODY—Five passenger. Color and design exclusively our own
GASOLINE CAPACITY—20 gallons.
EQUIPMENT—Magneto, batteries, two large gas head-lights, two dash lamps, one rear lamp, generator, tube horn, robe rail, well-equipped roll tool kit, jack, tire pump, tire repair outfit, tool box attached to running board.

This car is all that our twelve years' experience has taught us that the car should be,—in material workmanship and appearance, and sells at a price that defies competition. Special attention is called to the body equipment—the type is the "Montclair," the finish is par excellence. Nothing approaches it in appearance on cars selling for less than $5000. Write us now for agency proposition and represent the best selling car for 1910

# H. J. KOEHLER CO.

1711 BROADWAY, N. Y. CITY

# PREMIER

## The 1910 Car

**Is it the Four-cylinder Gold Premier or the Six?**
**Is it the car with the lowest price, regardless of price?**

In building the Premier we have never considered the man who is **ready to sacrifice real road value and clean cut lines for the sake of automobile frou-frou and pretty non-essentials.**

We've always built for road use, for actual service, and for the style **that reflects the spirit of capability and efficiency.**

**We have never allowed an item of expense to enter that would not** be accounted for in full value in the cars built.

The Glidden Tours of 1907, 1908 and 1909 every test and contest of the many to which the Premier has been subjected, has demon**strated absolutely, this:**

That for days on end, at every [illegible] at any price can come with [illegible]

**FOUR-FORTY**

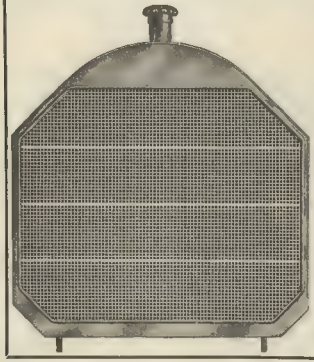
5 or 7 Passenger Touring Car:
Single and Double Roadster:
The Clubman, Tonneauette Car
Single Ignition, $3,000
Double Ignition, $3,500

**SIX-SIXTY**

5 or 7 Passenger Touring Car:
Single and Double Roadster:
The Clubman, Tonneauette Car:
Double Ignition, - $3,500.

**PREMIER MOTOR MFG. CO.** *Standard Mfrs A M C M A* **INDIANAPOLIS, IND.**

# FEDDERS Real Square Tube RADIATOR



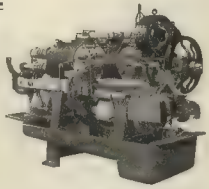
We furnish either our regular staggered tube radiator or the straight lines as shown on cut. **But, remember,** ours is the **real square tube radiator;** no square tube effect or imitation.

We are the only concern making a real square tube radiator.

Of course, the square tube is better—that's why the others imitate it.

**Fedders Mfg. Works**
**57-65 Tonawanda Street**
**Buffalo :: New York**

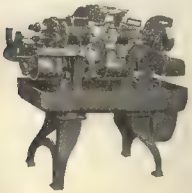
# The "Acme Automatic" TODAY



is the logical result of ten years' labor and improvement.

The greatest success yet achieved by any Screw Machine is now being demonstrated daily by operators of

**THE ACME-AUTOMATIC MULTIPLE SPINDLE**



They get the best and most product with the least labor and expense of upkeep.

May we send you particulars?

**THE NATIONAL-ACME MFG. CO.**
CLEVELAND, OHIO

BRANCH OFFICES:—New York, Boston, Chicago, Atlanta
GEN. FGN. REP.—Alfred H. Schütte, Schuchardt and Schütte

# INFORMATION *for* AGENTS

1910 is to be an agents' year. No manufacturer has completely covered the country. Some very desirable territory is yet open and it remains for the live individuals to make connections that will hold for many years to come.

The territory itself is not hard to secure, but the difficulty is to select the line that will give you the best standing, the line that is the least difficult to sell and the least expensive to keep sold. A satisfied customer is your best advertisement.

# 1910 Knox LINE

## "WINNERS OF CONTESTS AND CUSTOMERS"

should receive your careful consideration as the most complete and representative, as well as the most versatile line of motor vehicles ever offered.

## CAN YOU SELL

4-40, 4-50 or 6-60 H. P. Touring Cars, Tourabouts, Tonneauettes, single or double rumble Raceabouts, single or double rumble Sportabouts Limousines, Landaulets, Sight Seeing Vehicles, Omnibuses, Ambulances, Police Patrol Wagons, Fire Apparatus, or any form of Industrial Motor Vehicle? We make them all and in any size, from the smallest to the largest. Now is the time to get in touch with

## KNOX AUTOMOBILE CO.

**MEMBERS A. L. A. M.** **SPRINGFIELD, MASS.**

# Pullman AUTOMOBILES

**Model K Touring Car, 30 H. P.**

**Price $2,000**

"Not only the best at the price; But the best at any price."

| | | | | | |
|---|---|---|---|---|---|
| Model L, 20 H. P. | Runabout, | $1500 | Model 6-30, | Light Speed Car, | $2500 |
| " L, 20 " | Toy Tonneau, | 1600 | " 4-40, | Roadster, | 3000 |
| " K, 30 " | " " | 2000 | " M, | Touring Car, | 3500 |
| " K, 30 " | Touring Car, | 2000 | " M, | Toy Tonneau, | 3500 |

Once "PULLMAN" always "PULLMAN"

**YORK MOTOR CAR CO., Inc.,** **York, Pa.**

Agents Wanted in Unoccupied Territory

# INFORMATION *for* AGENTS

1910 is to be an agents' year. No manufacturer has completely covered the country. Some very desirable territory is yet open and it remains for the live individuals to make connections that will hold for many years to come.

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## CAN YOU SELL

4-40, 4-50 or 6-60 H. P. Touring Cars, Tourabouts, Tonneauettes, single or double rumble Raceabouts, single or double rumble Sportabouts Limousines, Landaulets, Sight Seeing Vehicles, Omnibuses, Ambulances, Police Patrol Wagons, Fire Apparatus, or any form of Industrial Motor Vehicle? We make them all and in any size, from the smallest to the largest. Now is the time to get in touch with

## KNOX AUTOMOBILE CO.

**MEMBERS A. L. A. M.** **SPRINGFIELD, MASS.**

# Pullman AUTOMOBILES

**Model K Touring Car, 30 H. P.**

**Price $2,000**

"Not only the best at the price; But the best at any price."

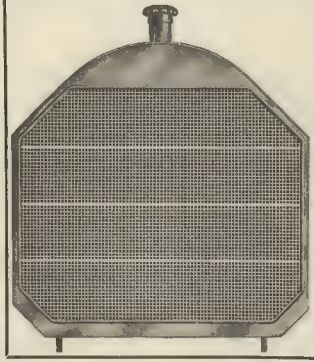
| | | | | | |
|---|---|---|---|---|---|
| Model L, 20 H. P. | Runabout, | $1500 | Model 6-30, | Light Speed Car, | $2500 |
| " L, 20 " | Toy Tonneau, | 1600 | " 4-40, | Roadster, | 3000 |
| " K, 30 " | " " | 2000 | " M, | Touring Car, | 3500 |
| " K, 30 " | Touring Car, | 2000 | " M, | Toy Tonneau, | 3500 |

Once "PULLMAN" always "PULLMAN"

**YORK MOTOR CAR CO., Inc.,** **York, Pa.**

Agents Wanted in Unoccupied Territory

# FEDDERS Real Square Tube RADIATOR



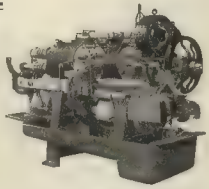
We furnish either our regular staggered tube radiator or the straight lines as shown on cut. **But, remember,** ours is the **real square tube radiator;** no square tube effect or imitation.

We are the only concern making a real square tube radiator.

Of course, the square tube is better—that's why the others imitate it.

**Fedders Mfg. Works**
**57-65 Tonawanda Street**
**Buffalo :: New York**

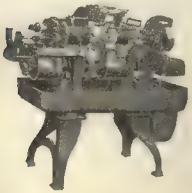
# The "Acme Automatic" TODAY



is the logical result of ten years' labor and improvement.

The greatest success yet achieved by any Screw Machine is now being demonstrated daily by operators of

**THE ACME-AUTOMATIC MULTIPLE SPINDLE**



They get the best and most product with the least labor and expense of upkeep.

May we send you particulars?

**THE NATIONAL-ACME MFG. CO.**
CLEVELAND, OHIO

BRANCH OFFICES:—New York, Boston, Chicago, Atlanta
GEN. FGN. REP.—Alfred H. Schütte, Schuchardt and Schütte

## PYRENE FIRE EXTINGUISHER AND IMPERIAL NON-EXPLOSIVE CAN

The two specialties illustrated herewith are sold by M. L. Snyder, 9 North Fourth street, Philadelphia.

Pyrene fire extinguisher.

Pyrene is a fire extinguisher that is claimed will instantly put out burning benzine, gasoline, naphtha, calcium carbide and electrical fires. Any incipient fire of whatever nature not yet requiring the services of the Fire Department, is extinguished with ease and quickness.

The contents of this extinguisher, it is claimed, will not harm anything, from the color and texture of the most delicate fabric, or the polish and finish of the finest woodwork, to an electric motor, and will not leave the faintest suspicion of a mark or stain. Pyrene will not freeze up to 60 degrees below zero and never deteriorates. It weighs 4 pounds complete and never needs recharging until it is fully discharged.

The Imperial Non Explosive cans are made in conformity with the Underwriters' laboratories' specifications, fitted with the Imperial Device. They are made from 24 to 26 gauge galvanized steel bodies, cold-rolled steel No. 22 cone tops and bottoms, spouts lugged and riveted to cone top, the cone top riveted to body of can, then soldered inside; and the bottom riveted and soldered, making an indestructible steel can. Cans so made and fitted with the Imperial Device on the spout, are claimed to be scientifically correct and non-explosive, although filled with the most explosive fluids, subject to heat or flame. It is claimed the Imperial Can has the life of several other cans and by actual test preserves the strength of the contents and

"Imperial" non explosive can.

saves from 33 to 50 per cent. in evaporation and waste.

The prices of Imperial Cans are from $1 50 for the pint size to $10 for the ten-gallon size.

## THE "ECONOMIC" PISTON RING EXPANDER

By means of this device piston rings can be placed on the piston and removed in about 10 seconds and without fear of injuring the rings. The expander works equally well with any form of cut, whether diagonal, square, lap, tongue, or drilled and split.

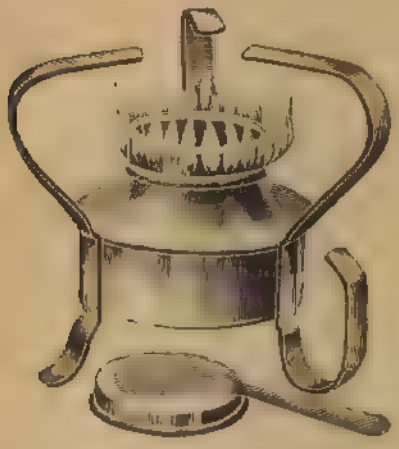
On large bevel cut rings on account of the great strain it is necessary to drill a very small hole in the ends of the ring, but on small bevel rings up to 7 inches in

Setting a Piston Ring with the "Economic" Piston Ring Expander.

# Alcohol Gas Lamps

Makes its own Gas, is Odorless, Burns Wood or Grain Alcohol, Will Support Weight up to 100 Pounds

**ACME**



**SUNBURST**

| No. | | Per Doz. |
|---|---|---|
| **11**–**Acme,** | Heavy Tin, Weighs 8 oz., Holds 7 oz. of Alcohol | $ 5.00 |

One-twelfth Doz. in a Box

| No. | | Per Doz. |
|---|---|---|
| **41**–**Sunburst,** | made of one piece of Spun Brass, Highly Nickel Plated | $10.00 |

# Alcohol Gas Stoves

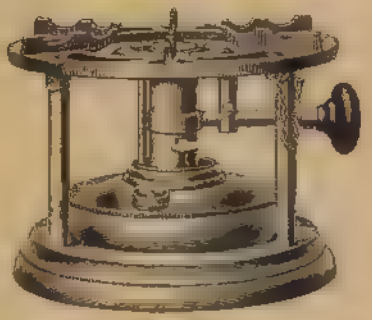
**MANNING-BOWMAN**

No. 58

Burner produces perfect combustion. Burns with an intensely hot blue flame. Noiseless, very economical and absolutely safe. Can be lighted without removing lamp from frame.

Regulates Perfectly—is Odorless and Sootless.

Any Cooking Utensil can be used on these Stoves.



No. 60

| No. | | Each |
|---|---|---|
| **58**— | Nickel Plated with Wrought Steel Stand Diameter at top 6½ inches Will burn three hours without refilling | $ 2.50 |
| **60**— | Brass. Nickel-Plated with Cast Hinged Top. Diameter at top 6½ inches Will burn one and one-half hours without refilling. Especially adapted for percolators and for table use in general | 3.50 |

Denatured (commercial) Alcohol should be used. The burner is so constructed that it mixes air with the gas manufactured by the alcohol, which produces a blue flame, clean and intensely hot. The wick will not burn or char—is everlasting.

# Universal Coffee Percolators

**Operates Successfully on any Stove or Gas Range**

**Extra Parts**

| | Per Doz. |
|---|---|
| Glass Tops, list | $0 60 |
| Ebonized Handles | 1.80 |
| Tube Brushes | 2.00 |

**Blue Enameled with White Enameled Linings**

| No. | Capacity | Each |
|---|---|---|
| 1104 | 4 Cups, 1½ Pints | $ 2.50 |
| 1106 | 6 Cups, 3 Pints | 3.00 |
| 1109 | 9 Cups, 4 Pints | $ 3.50 |
| 1114 | 14 Cups, 6 Pints | 4.00 |

**Colonial Pattern**

**Pure Aluminum**
**Genuine Ebony Handle**

**Empire Pattern**

| No. | Capacity | Each |
|---|---|---|
| 64 | 4 Cups, 1½ Pints | $ 3.50 |
| 66 | 6 Cups, 3 Pints | 4.00 |
| 69 | 9 Cups, 4 Pints | 4.50 |
| 614 | 14 Cups, 6 Pints | 5.00 |
| 74 | 4 Cups, 1½ Pints | $ 3.50 |
| 76 | 6 Cups, 3 Pints | 4.00 |
| 79 | 9 Cups, 4 Pints | 4.50 |
| 714 | 14 Cups, 6 Pints | 5.00 |

Sectional View

# Universal Coffee Percolating Machines

The action of the automatic pump forces the water through the tube while it is only luke-warm; as the water is gradually heated, the percolating process is going on all the time, the wholesome qualities of the Coffee are extracted, and by the time the water has reached the boiling point, which seems necessary to bring out the flavor and aroma, the Coffee is ready to serve.

Nos. C 004 and N 004, etc.

**Full Polished Copper**

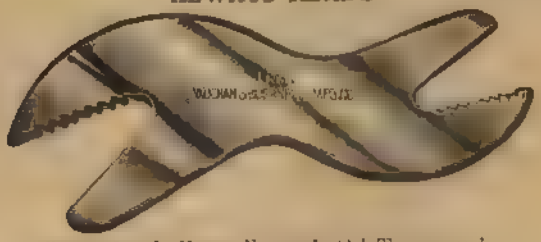
| No. | Capacity | Each |
|---|---|---|
| C 006 | 6 Cups | $10.50 |
| C 009 | 9 Cups | 11.75 |

**Nickel Plated Copper**

| No. | Capacity | Each |
|---|---|---|
| N 006 | 6 Cups | $10.50 |
| N 009 | 9 Cups | 11.75 |

# Wrenches

## ALWAYS READY



Solid Steel, Drop Forged, Oil Tempered
Full Polished and Nickel Plated

| No. | Length | Holds Pipe | Per Doz. |
|---|---|---|---|
| 1– | 5 in. | ⅛ to ¼ in. | $ 6.00 |
| 2– | 7 in. | ⅛ to 1¼ in. | 8.00 |

One-half Doz. in a Box

## RIVAL

Solid Steel, Drop Forged, Oil Tempered
Oil finished Body, Polished Jaws

| No. | Length | Holds Pipe | Per Doz. |
|---|---|---|---|
| 10 | 5 in. | ⅛ to ¼ in. | $ 5.50 |
| 20– | 7 in. | ⅛ to 1¼ in. | 7.50 |

One-half Doz. in a Box

## BICYCLE

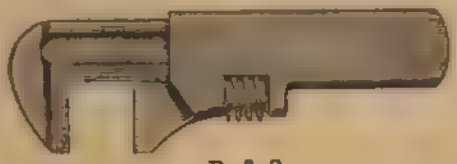
U. S.

Solid Steel, Drop Forged, Satin Finish

| No. | Length | Opens | Per Doz. |
|---|---|---|---|
| 15 | 5½ in. | 1¼ in. | $ 4.00 |

One-half Doz. in a Box

## BICYCLE



B. & S.

Solid Steel, Drop Forged, Extra Quality, Length 4½ in.
Opens 1⅜ in.

| No. | Finish | Per Doz. |
|---|---|---|
| 97 B | Gun Metal | $ 8.00 |
| 97 N | Nickel Plated | 9.00 |

One-twelfth Doz. in a Box

## GENUINE WESTCOTT

Adjustable "S" Nut Wrench

Malleable Iron Handles, Forged Steel Jaws, Warranted

| No. | Length | Opens | Per Doz. |
|---|---|---|---|
| 76 | 6 in. | ¾ in. | $ 7.20 |
| 78 | 8 in. | 1 in. | 9.00 |
| 80 | 10 in. | 1⅜ in. | 12.00 |
| 82 | 12 in. | 1⅝ in. | 15.00 |

One-half Doz. in a Box

Adjustable "S" Pipe Wrench

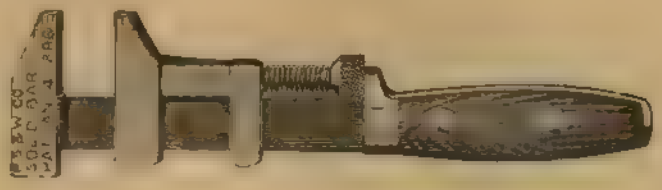
Malleable Iron Handles, Forged Steel Jaws, Warranted

| No. | Length | Holds Pipe | Per Doz. |
|---|---|---|---|
| 86 | 6 in. | ⅛ to ⅜ in. | $12.00 |
| 88 | 8 in. | ⅛ to ¾ in. | 15.00 |
| 90 | 10 in. | ⅛ to 1 in. | 18.00 |
| 92 | 12 in. | ⅛ to 1¼ in. | 24.00 |

# Wrenches

## P. S. & W.-SOLID HANDLE

The entire piece one Solid Steel Forging



Ellrich's Patent—Case Hardened and Polished Jaws—Fully Warranted  By actual tests the Strongest Wrench made

| Length | Jaws Open | Per Doz. |
|---|---|---|
| 6 in. | ⅞ in | $ 9 00 |
| 8 in. | 1¼ in | 10 00 |
| 10 in. | 1¾ in | 12 00 |
| 12 in. | 2⅛ in | 14 00 |
| 15 in. | 2¾ in | 21 00 |
| 18 in. | 3⅛ in | 30 00 |
| 21 in. | 4¼ in | 36 00 |

6 to 12 in., One-half Doz.; 15 and 18 in., One-third Doz.; 21 in., One-twelfth Doz. in a Wooden Box

## COES

**Knife Handle**

Forged Tool Steel, Case Hardened Jaws, Black

| Length | Jaws Open | Per Doz. |
|---|---|---|
| 6 in. | 1 in | $ 9.00 |
| 8 in. | 1¼ in | 10.00 |
| 10 in. | 1¾ in | 12.00 |
| 12 in. | 2¼ in | 14 00 |
| 15 in. | 2⅝ in | 24 00 |
| 18 in. | 3¼ in | 30.00 |
| 21 in. | 4⅛ in | 36.00 |

6 to 12 in., One-half Doz.; 15 to 21 in., One-third Doz. in a Package

**Steel Handle**

Forged Tool Steel, Case Hardened Jaws, Extra Heavy
The Best Railroad Wrench

| Length | Jaws Open | Per Doz. |
|---|---|---|
| 6 in. | 1 in | $ 9.00 |
| 8 in. | 1¼ in | 10.00 |
| 10 in. | 1¾ in | 12.00 |
| 12 in. | 2¼ in | 14 00 |
| 15 in. | 2⅝ in | 24.00 |
| 18 in. | 3¼ in | 30.00 |
| 21 in. | 4⅛ in | 36.00 |

6 to 12 in., One-half Doz.; 15 to 21 in., One-third Doz. in a Package

## AGRICULTURAL

Wrought Iron, Case Hardened Jaws, Black

| Length | Jaws Open | Per Doz |
|---|---|---|
| 6 in. | 1 in | $10.00 |
| 8 in. | 1¼ in | 12 00 |
| 10 in. | 1⅝ in | 14 00 |
| 12 in. | 2 in | 17.00 |
| 15 in. | 2⅛ in | 24.00 |

One-half Doz. in a Package

## B. & C. COMBINATION

**No. 45**

Forged Tool Steel, Case Hardened Jaws, Full Polished, Long Nut, Combination Nut and Pipe

| Length | Holds Pipe | Per Doz. |
|---|---|---|
| 10 in. | ¼ to 1 in | $25.25 |
| 12 in. | ¼ to 1½ in | 28.50 |
| 15 in. | ¼ to 2 in | 40.50 |

One-half Doz. in a Wooden Box

# "American" Electric Irons

## "BEAUTY" TYPE

The "Beauty" type shown here is the latest electric iron of our manufacture and in it are embodied all of the valuable feature, which our experience shows an electric iron should have.

It is of prime importance that the heating qualities of an electric iron should be right. There must be sufficient metal in the bottom of the iron to hold the heat—to act as a "reservoir" for heat, so that in case any sudden demand is made upon the iron, there will be no sudden cooling Tests—such as "scorch print tests" or so-called "laboratory tests," usually prove absolutely nothing conclusive as to the [illegible] board. With this in mind, the "Beauty" type iron has been designed.

Notice how the point or "nose" of the "Beauty" type iron has been cut away so that the user can get into [illegible] ironing board particularly easy for the ironer, and such as to make the iron of pleasing appearance.

[illegible] ever made. This is due to the simplicity of construction, easy accessibility and renewability of all parts.

The "Beauty" [illegible] looking condition, as there are no screws, nuts or rivets to act as dirt catchers.

[illegible] immediate use by attachment to an ordinary electric lamp socket.

| No. | Weight | Shape | | Watts | Each. |
|---|---|---|---|---|---|
| 6½— | 6½ lbs. | "V" shape | Nickel polished | 525 | $5.00 |
| Extra Elements | | | | | 1.50 |

Voltages—Made in standard voltage ratings. [illegible] voltage [illegible] cuit on which irons are to be used

## NEW "AMERICAN" DISC STOVES

No. 3210

Made with "Steel Clad" Element attached directly to the top plate.

The heater is compactly and neatly designed, consisting of a circular disc supported by a metal frame finished in polished nickel, with two ebonoid handles. The legs of the stand are heat insulated and no matter how hot the stove may be, no heat will be transmitted to the surface on which it rests.

### Domestic Style

| No. | Diam. | Volts | Watts | | Each. |
|---|---|---|---|---|---|
| 3210 | —4 in. | 95 to 250 | 350 | Single Heat. | $ [illegible] |
| 3221 | –5 in. | 95 to 250 | 400 | Single Heat. | 4 75 |
| 3231 | 6 in. | 95 to 250 | 450 | Single Heat. | 5 50 |

[illegible] Stove furnished complete with 6 ft. cord, detachable at [illegible] heat- attachment to an ordinary lamp socket

### Industrial Style

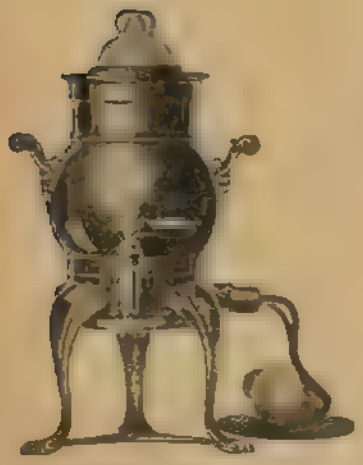
| No. | Diam. | Volts | Watts | | | Each. |
|---|---|---|---|---|---|---|
| 3260 | — 8 | 95 to 250 | 800 | 1 | [illegible] | $ 9 00 |
| 3265 | — 8 | 95 to 250 | 800 | 3 | [illegible] | 11 00 |
| 3270 | —10 | 95 to 250 | 1100 | 1 | [illegible] | 1 00 |
| 3275 | -10 | 95 to 250 | 1100 | 3 | [illegible] | [illegible] 0 |
| 3280 | —12 | 95 to 250 | 1500 | 1 | [illegible] | 1 00 |
| 3285 | —12 | 95 to 250 | 1500 | 3 | [illegible] | 15 00 |

"Universal" Stoves for one heat are equipped with binding posts only, and without cord or plug switch Those for three heats are provided with 4 ft cord and three heat regulating porcelain plug switch.

In ordering always specify exact Voltage

# Electrical Heating Apparatus

## "AMERICAN" COFFEE PERCOLATORS



### "Newport" Type

The principle on which this percolator is built is the latest and most up-to-date, and its results could not be improved upon. It percolates in about a minute after the current is turned on and coffee is made within a few minutes afterwards depending upon the strength required.

The heating element is attached directly to the bottom of the percolator. Instead of it being necessary to boil the entire volume of water in the percolator before it begins to percolate, heat is applied only to the small portion of water which is contained in the automatic valve at the bottom of the percolator. Thus the water is heated by installments, so to speak, and the machine will percolate very quickly.

The standard finish of the percolator is nickel, although copper can be furnished on special order.

Each machine is furnished complete with heating element, cord detachable at the pot, and adapted to fit the ordinary lamp socket.

| No. | Volts | Watts | Capacity | |
|---|---|---|---|---|
| 2004 | 0 to 250 | 325 | 4 Cups... | $12 50 |
| 2006 | 0 to 250 | 325 | 6 Cups.. | 13 75 |
| 2009 | 0 to 250 | 325 | 9 Cups... | 15 00 |

Specify exact Voltage when ordering.

### "Empire" Type

This consists of a coffee percolator pot with special disc stove. The two are separate, the pot being placed upon the stove, which is specially designed to heat quickly.

The pot is built and percolates on exactly the same principle as the "Newport" type. It will not percolate quite so quickly as this type, but the difference in time is so little that it is of no consequence and absolutely perfect results are obtained.

The pot is made of one piece of Aluminum: no seams. The special disc stove is finished in polished nickel.

The machine is furnished complete and consists of pot, disc stove, cord detachable at the stove and adapted for use with the ordinary lamp socket.

"Empire" Type.

| No. | Volts | Watts | Capacity | |
|---|---|---|---|---|
| 2206 | 0 to 250 | 350 | 6 Cups | $ 9 00 |
| 2209 | 0 to 250 | 350 | 9 Cups | 10 00 |
| 2214 | 0 to 250 | 350 | 14 Cups.. | 11 00 |

Extra Cords, Plugs, etc., listed on page 7

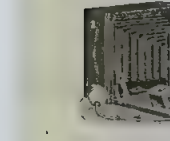
# "ARROW" Dry Plate CAMERAS

**"Arrow" Dry Plate Cameras** are our own brand, **guaranteed by us to take first class pictures** and to be equal in construction to any of the more expensive makes. They embody all the latest improvements, such as rising and sliding front, reversible view finder for quick focusing, bulb release shutter, removable back, etc. No more satisfactory or convenient plate cameras are made, yet our prices are the lowest ever quoted for the values represented. Before committing yourself on camera goods, investigate our line.

### 1909 MODEL "ARROW" FOLDING DRY PLATE CAMERAS.

Arrow [illegible] for [illegible] to [illegible] of [illegible] hinge. Camera boxes are made with dovetail corners covered with superior quality black grain leather, high grade black bellows lined with genuine cloth. All metal parts are of brass nickly nickel plated making a beautiful contrast against the ebony finish. Each with **one plate holder and carrying case with** space for 3 extra plate holders.

**K5001.** "Arrow" 4x5 — Focal capacity 7½ inches, dimensions of camera 9¼x8¼x5¾, rising and falling front, removable back, with spring actuated ground glass panel for focusing, reversible mask, bound and beaded view finder, 2 tripod sockets. Has shutter with bulb and tube attachment. Single achromatic lens, each with one double plate holder and carrying case,
Each **$5.25**



**K5003** "Arrow" 4x5—Fitted with rapid rectilinear lens. This improved dust proof shutter with bulb and tube attachment, reversible view finder, and instantaneous exposures, focal capacity 9½ in., rising and falling front, reversible hooded view finder, 2 tripod sockets, removable back with ground glass panel for focusing. Each, **$6.95**

**K5007** "Arrow" 4x5—Focal capacity 11¼ in., reversible back, spring actuated ground glass panel for focusing, swing back and bed, rising, falling and sliding front, rack and pinion for focusing with looking device, tripod sockets, brilliant reversible metal bound and beaded view finder, speed indicator for time, bulb and instantaneous exposures, [illegible] for time exposures, [illegible] for instantaneous exposures, [illegible] for ordinary conditions. Each, **$15.75**

**K5008.** "Arrow" 5x7—Focal capacity 17¼ in., dimensions of camera 9¼x8¾x8¾, otherwise as K5007. Each, **$19.95**

### NO BETTER CAMERA TO BE HAD AT THE PRICE.

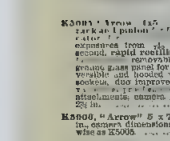
*Has triple convertible lens and every feature required by expert photographers*

### FOLDING POCKET POST CARD PLATE CAMERA.

**K9000**—"Arrow," 3¼x5½, focal capacity 9½ in., removable back, spring actuated ground glass panel for focusing, rising and falling front, rack and pinion with looking glass, 2 tripod sockets, brilliant reversible metal bound and beaded view finder, Unicum automatic shutter, bulb and tube attachment, rapid rectilinear lens, special focus 7 to 8in. Size of plate when with plate holder and manual of photography
Each, **$3.50**

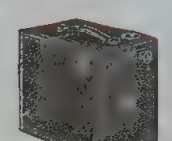


**K5001** "Arrow" 4x5—Focal capacity 11¼ inches, dimensions of camera 9¼x8¼x5¾, rising and falling front, reversible back, with spring actuated ground glass panel for focusing, reversible mask, bound and beaded view finder, 2 tripod sockets. Has shutter with bulb and tube attachment. Single achromatic lens, each with one double plate holder and carrying case,
Each, **$5.25**



**K5009** "Arrow" 4x5—Fitted with Unicum automatic shutter, bulb and tube attachment, rapid rectilinear lens, special focus 7 to 8in. Size of plate when with plate holder and manual of photography
Each, **$3.50**

### 4x5 BOX PLATE CAMERA.



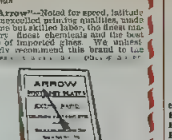
**K5000, "Arrow Special"** Takes first class pictures. Fixed focus with automatic shutter for time and instantaneous exposures, single achromatic lens. 2 view finders, 2 tripod sockets, instruction book and 1 double plate holder covered with seal grain imitation leather, nicely finished, space in back for carrying 2 extra plate holders Each **$2.10**

## DRY PLATES.

### "ARROW" DRY PLATES.

*A very popular brand that is its own salesman*

"Arrow"—Noted for speed, latitude and unexcelled printing qualities, made by most skilled labor, the finest machinery, finest chemicals and the best grade of imported glass. We unhesitatingly recommend this brand to the [illegible]



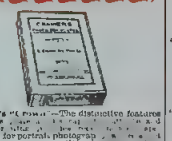
**K5070** 4x5, 50 doz. to case. Case lots, per dozen, (Less than case lots, 27c) **24c**

**K5027**—4½x6½, 50 doz. to case. Case lots, per dozen, (Less than case lots, 32c) **30c**

**K5028**—4x5, 50 doz. to case. Case lots, per dozen, [illegible] **34c**

**K5043** 4¼x6½ 50 doz. to case. Case lots, per dozen, (Less than case lots, 55c **52c**

**K5024**—5x7, 20 doz. to case. Case lots per dozen (Less than case lots, 62c) **60c**



### Cramer's "Crown"

[illegible] The distinctive features [illegible] ideally for portrait, photographic [illegible] exposures are essential. A [illegible] for instantaneous exposures.

| Size | Doz. to Case | Doz. in Case Lots | Less than Case Lots |
|---|---|---|---|
| [illegible] | [illegible] | $0 94 | $0 96 |
| [illegible] | [illegible] | 40 | 43 |
| [illegible] | [illegible] | 55 | 60 |
| [illegible] | [illegible] | 67 | 69 |
| [illegible] | [illegible] | 70 | 72 |

### Cramer's "Banner X"

—Especially recommended for the hand camera, its great latitude gives a splendid, snappy printing negative, full of detail in the shadows, for general use in portrait and outdoor photography this plate is unsurpassed.

| Size | Doz. to Case | Doz. in Case Lots | Less than Case Lots |
|---|---|---|---|
| K5030—3¼x4¼ | 30 | $0 31 | $0 32 |
| K5031—3¼x5½ | 30 | 42 | 44 |
| K5032—4x5 | 30 | 55 | 58 |
| K5033—4½x6½ | 30 | 75 | 78 |
| K5034—5x7 | 20 | 85 | 87 |

### Cramer's "Instantaneous Isochromatic"

The finest rapid plate made, these plates have color value and are fully isochromatic, unexcelled for portraits and all work where a rapid exposure is required, highly sensitive to yellow and artificial light, and are the best plates for flashlight exposures

| Size | Doz. to Case | Doz. in Case Lots | Less than Case Lots |
|---|---|---|---|
| [illegible] | 20 | $0 [illegible] | $0 [illegible] |
| [illegible] | 20 | 42 | 44 |
| [illegible] | 20 | 55 | 58 |
| [illegible] | 20 | 75 | 78 |
| [illegible] | 20 | 85 | 87 |

### SEED'S DRY PLATES.

**Seed's No. 36X** Very rapid Especially desirable for amateurs' work

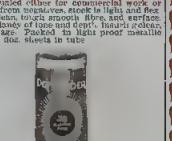
| Size | Doz. to Case | Doz. in Case Lots | Less than Case Lots |
|---|---|---|---|
| K6070—4x5 | 12 | $0 [illegible] | $0 [illegible] |
| K6071—5x7 | 12 | 85 | 87 |

**Seed's No. 27**—Gilt edge, extra rapid, for instantaneous work

| Size | Doz. to Case | Doz in Case Lots | Less than Case Lots |
|---|---|---|---|
| K6072—4x5 | 20 | $0 [illegible] | $0 [illegible] |
| K6073—5x7 | 20 | 85 | 87 |

### "SUN SPOT" BLUE PRINT PAPER.

Unequaled either for commercial work or printing from negatives, made in light and flexible, medium, rough smooth surface, and surface, has brilliancy of tone and depth. Insures perfect sharp image. Packed in light proof metallic tubes. 2 doz. sheets in tube



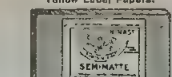
| | |
|---|---|
| K7020 [illegible] | To [illegible] 11c |
| K7021 [illegible] | 11c |
| K7022 [illegible] | 14c |
| K7023 [illegible] | 14c |
| K7024 [illegible] | 18c |
| K7025 [illegible] | 24c |

## "CyKo" DEVELOPING PAPERS.

Print by lamp or gas light.

Equal to any papers made. Thoroughly guaranteed by the Anseo Co.

**Yellow Label Papers.**



Normal grade, semi-matte finish, for general use. 1 gro. in box.

| | | |
|---|---|---|
| K8054—3¼x3¼ | (Gro. 80c) | Box. 8c |
| K8055— " 3¼x4¼ | (Gro. 80c) | " 8c |
| K8056— " 3¼x5½ | (Gro. $1.00) | 10c |
| K8057— " 3¼x6½ | (Gro. 80c) | 8c |
| K8058— " 3½x5½ | (Gro. $1.00) | 10c |
| K8059— " 4x5 | 1.00 | " 10c |
| K8060— " 5x7 | 2.00 | " 20c |

### ARGO DEVELOPING PAPER.

The best paper for general use. Uniformly even prints are absolutely permanent, has wide latitude in development and will not fog or crock through carelessness. Absolutely reliable in [illegible]

"Argo" Carbon Gloss — Yields rich glossy prints. 1 doz. sheets in pkg. 1 gro. in box.

| | | |
|---|---|---|
| K7000—Size 3¼x3¼ | (Gro. 80c) | Pkg. 8c |
| K7007— " 3¼x4¼ | (Gro. 80c) | " 8c |
| K7008— " 3¼x5½ | (Gro. $1.00) | 10c |
| K7009— " 4x5 | 1.00 | " 10c |
| K7010— " 5x7 | 1.50 | " 15c |
| K7011— " 8x7 | 2.00 | " 20c |

"Argo" Carbon Velour—Yields soft velvety prints. 1 doz. sheets in pkg. 1 gro. in box.

| | | |
|---|---|---|
| K7006—Size 3¼x3¼ | (Gro. 80c) | Pkg. 8c |
| K7007— " 3¼x4¼ | (Gro. 80c) | " 8c |
| K7008— " 3¼x5½ | (Gro. $1.00) | 10c |
| K7009— " 4x5 | 1.00 | " 10c |
| K7010— " 5x7 | 1.50 | " 15c |
| K7011— " 8x7 | 2.00 | " 20c |

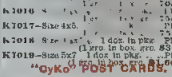
### "DISCO" PRINTING OUT PAPER.

"Disco" gloss is a gelatine printing out paper of the highest grade, developed and worked in daylight, yields excellent results. Prints are absolutely permanent. 1 gro. in box.

| | | |
|---|---|---|
| K7014—Size 3¼x4¼ | 2 doz. in pkg. | Pkg. 12c |
| K7015— " 3¼x5½ | 1 doz. in pkg. | " 12c |
| K7016— " 4x5 | 1 doz. in pkg. | " 14c |
| K7017—Size 4x5 | 1 doz. in pkg. | " 14c |
| K7018—Size 5x7 | 1 doz. in pkg. | Pkg. 12c |
| | 1 doz. in box. | (Gro. 85c) |
| K7019—Size 5x7 | 1 doz in pkg. | Pkg. 21c |
| | 1 doz. in box. | (Gro. $1.75) |

### "CyKo" POST CARDS.

Printed and developed same as "CyKo" [illegible] 3¼x5½.



| | |
|---|---|
| Yellow Label. | |
| K8064—Semi-matte [illegible] | |
| Doz. | 10c |
| (Gro. $1.00) | |
| K8065 [illegible] | 10c |
| [illegible] | $1.00 |

### "ARGO" POST CARDS.

[illegible] gives a soft, velvety [illegible] pkg. 1 gro. in box

| | |
|---|---|
| K7012—Gloss (gro. $1.00) | Per pkg. 10c |
| K7013—Velour, (Gro. $1.00) | Per pkg. 10c |

TRY US BOTH. Give our offerings the same fair test that you give those of the traveling salesman. If you do that we are reasonably certain of at least a part of your business.

# CAMERA GOODS

## OUR NEW AND LARGER LINE

A Line that has grown into immense popularity with our trade. "Ansco" and "Arrow" cameras embody every important improvement that is to be found anywhere in construction, and are guaranteed to us and by the manufacturer to give perfect satisfaction to both amateur and professional picture takers. The prices that we quote are rock bottom, and you get the advantage of this saving whether you buy one camera a season or six, or fifty. We want a FIRST order from you, we will be sure of a SECOND.

## "Ansco" FILM CAMERAS

Place samples on show. "Ansco" Film Cameras and supplies are made by an old established firm, [illegible] guaranteed [illegible]

No. 2 FOLDING POCKET ANSCO CAMERA

**Takes Post Card Size Pictures.**

*A POPULAR SIZE. An owner of this*

K8011 [illegible]

Instantaneous exposures graduated t[illegible]

$17.85

"BUSTER BROWN" FILM CAMERA.

K8000—No. 2 "Buster Brown." Takes pictures 2¼ x 2¼ size, adapted for 6 exposures only. Camera 2¾x4¾x 5¾, wt. 11 oz. Fitted with fine quality lens and shutter for both snap shot and time exposures. 2 ground glass finders for horizontal and vertical pictures. Each in 1 1-16 in. grained leather covered carton. Retail price $2.00. Each, $1.50

K8001 No. 1 Folding "Buster Brown." [illegible] size. C[illegible]

$4.87

FOLDING POCKET "ANSCO" FILM CAMERAS.

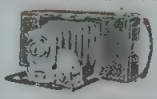
A splendid camera for the Tourist as it is size and shape permit of its being carried conveniently in the overcoat pocket.

Covered with fine black seal grain leather, maroon leather bellows, piano polish mahogany bed. Adapted for 6 or 12 exposure films. All with brilliant, reversible finder and tripod sockets, and vertical pictures. [illegible] Shutter works on one [illegible] part of a second.

K8006—No. 4 Folding Pocket Ansco. [illegible] 4x5 size. Camera 5x6½x8¼, wt. 3 lbs. Adapted for 6 or 12 exposures, 4x5 size. Covered with fine black seal grain leather, maroon leather bellows, piano polish mahogany bed, brilliant, reversible finder and tripod sockets, and vertical pictures. Shutter works on one [illegible] part of a second. Each, $10.15

K8007—No. 5 Folding Pocket Ansco. [illegible] 5x7 size, wt. 3[illegible] lbs. Adapted for 6 or 12 exposures, 5x7 size. Covered with fine black seal grain leather, maroon leather bellows, piano polish mahogany bed, brilliant, reversible finder, [illegible] covered. (Retail price $13.00) Each, $8.40

"ANSCO JUNIOR" FOLDING FILM CAMERA.



K8010, "Ansco"—Takes pictures 2½x3½ post card size. Camera 2x 3½x5¼, wt. 15 oz. Rapid Rectilinear lens. Other fittings concealed double valve dust proof shutter. Each, $1.90

"ANSCO" NON CURLING FILMS.

All stock we send out is guaranteed fresh and has date guarantee expires marked on same. All daylight loading each cartridge in carton.

K8012—2¼x2¼, 6 exposure. For No. 1 Buster and adapted to No. 1 [illegible] Each, 10½c

K8033—2¼x3¼, 6 exposure. For Nos. 2 and 3 Buster Brown, No. 1 Folding Buster Brown. Adapted for No. 2 Brownie and No. 2 Folding [illegible] 14c

K8[illegible] [illegible] 17½c

K8034—12 exposure, as K8033. Each 35c

K8[illegible] [illegible] For No. 3, 4 and 5 F. P. Kodak. [illegible] Brow[illegible]

[illegible] Hawkeye. Each, 24½c

K8[illegible] [illegible] 49c

K8[illegible] [illegible] Adapted to No. 2 Bullet, No. 2 Bulls-eye, No. 1, 2 F. P. Kodak, No. 2 Stereo and A1 Vista. Each 21c

K8040—12 exposures, as above. Each, 42c

K8041—2½x3½ exposure. For Nos. 3, 5, 7 and 9 Adapted to No. 3 Bullet, No. 4 Vest, No. 4 Panoramic Kodak, No. 4 B A1 Vista, No. 4 Weno Hawkeye and No. 4 folding Hawkeye. Each, 31½c

K8042—12 exposure, as above. Each, 63c

K8043—No. 10 Autog[illegible] [illegible] 28c

K8044—10 exposures, as above. Each, 49c

"ANSCO" FILM CAMERAS

K8002—No. 1 Ansco [illegible] [illegible] ...ly as the single achro[illegible]

...ease. (Retail price $18.50.) Each, $12.95

...eat [illegible] $3.50

K8001—No. 3 Ansco [illegible] [illegible] (Retail price $7.50) $5.08

K8003—No. 3 Ansco [illegible] [illegible] $5.43

K8005—No. 5 Ansco [illegible] [illegible] ...with greater precision. (Retail price $30.00.) Each, $14.00

K8017—[illegible] adapted to Nos. 9 and 10 [illegible] (K8010 and K8011) [illegible] Each, $2.63

ANSCO DRY PLATE ATTACHMENT.

Covered with grained leather to match "Ansco" cameras, adapted by substituting for regular back, complete with ground glass and [illegible] double dry plate holder.

K8095 [illegible] adapted to Nos. 4 and 5 (K8006 and K8007) [illegible] Each, $2.63

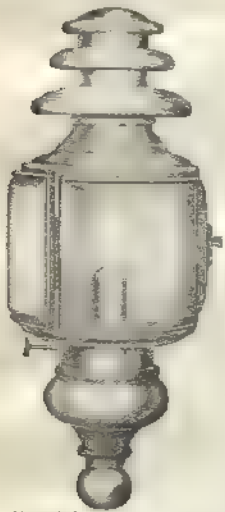
K8076—[illegible] and K8009) [illegible] $2.63

## CAMERA TIME

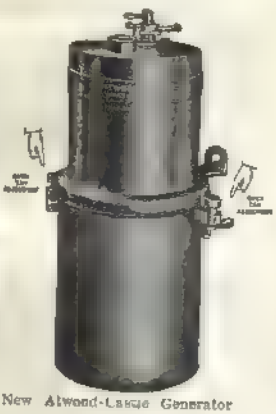
Summer time—vacation time—is pre-eminently "camera time." The amateur photographer has more time to spare for picture-taking in July and August than in the busy winter months. A window display of camera goods will bring the trade to you. Order your samples now.

## NEW ATWOOD-CASTLE LAMPS

The Atwood-Castle Co., of Amesbury, Mass., have brought out a new cylinder lamp called their 48 "S," designed especially for Landaulet, Limousine and Town cars. These lamps are designed to burn oil, or can be fitted with electric bulbs if desired. They are finished in full brass, white nickel or black nickel as desired.

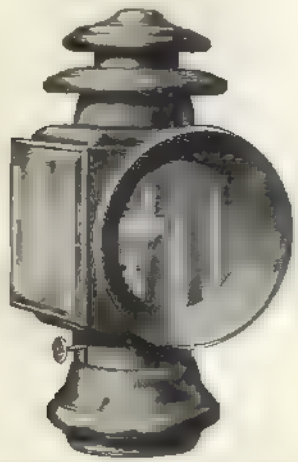


Atwood-Castle Style 48 S Lamp.



New Atwood-Castle Generator

This company is also showing a new line of square lamps both side and rear, designed especially for taxicabs and runabouts, very strong in construction, the body being made in one piece of heavy gauge brass.

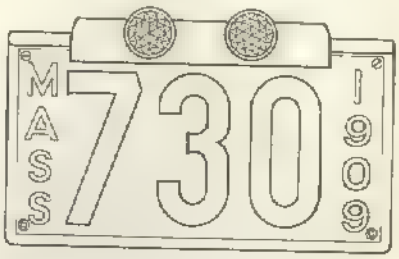


Atwood Castle Square Lamp for Taxicabs.

Included in the 1909 Atwood-Castle line is a new generator with a newly designed water valve which is said to be non-corroding. Another feature of this generator is a double drip which insures even distribution of water on the carbide and an even flow of gas

## THE GRAY & DAVIS ELECTRIC REAR LIGHT

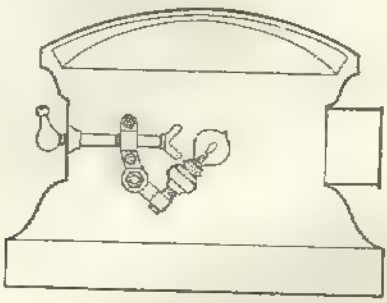
Gray & Davis, of Amesbury, Mass., the well-known lamp makers, have recently brought out a new electric light for showing a red light at the rear of the car and lighting up the license plate. The general features of this rear light are well shown in the accompanying drawing, by reference to which it will be seen that it is




Gray & Davis Electric Attachment for Gas Headlights.

equipped with two bulbs. Only one of these bulbs is used, the other serving as an emergency bulb for use in case the regular one gives out. Means are provided for protecting the reflector by a glass door and also for securing the bulbs so that they cannot be stolen. This rear light lists at $6, including two bulbs of 6 volt, 3 candle power size.

Gray & Davis are also now furnishing an electric attachment for gas headlights. It consists of an incandescent bulb on a swivel bracket which is designed to clamp



The Gray & Davis Electric Rear Light.

on the burner post of the gas lamp. When not in use the bulb can be thrown down below the level of the burner and when in use is turned up so that it comes directly over the regular gas burner. This attachment is intended for use in cities where the full glare of the acetylene lamp is not desirable, and it is easily thrown out of commission when it is desired to use the gas burner on country roads where plenty of light is desired.

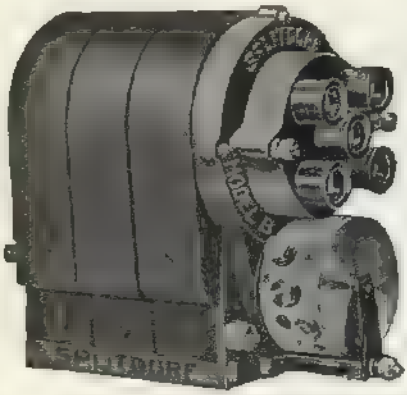
# NEVER PUT A MAGNETO ON YOUR CAR

## UNLESS IT IS THE BEST

## The

# SPLITDORF MAGNETO

### IS THE PRODUCT OF BRAINS, EXPERIENCE, CAPITAL AND SURPASSING FACILITIES



Those who are experienced in judging the wheat from the chaff —those who have made many experiments, trials and tests of different makes of ignition apparatus know and concede the great Superiority of the SPLITDORF Product.

You who are new in this matter—who for the first time are selecting Ignition Apparatus for your car—cannot follow a safer or surer guide than the more expert opinion of experienced motorists.

At the Paris exhibition, M. Pierre de Vasselot, the most eminent electrical engineer of Europe, said: "After a careful and thorough examination of the SPLITDORF Magneto, I am satisfied that *it has no equal in design and efficiency among Magnetos of the present day.*"

The SPLITDORF Magneto has the immense advantage of fifty years' electrical engineering experience behind it –and experience is a mighty factor in any time.

Into every SPLITDORF Magneto is put as much skill, precision, expert workmanship and choice material as if that one instrument was to be the one on which the SPLITDORF reputation rested.

You can equip your car with a SPLITDORF Magneto with the utmost assurance of having **the most perfect system of Ignition** that human ingenuity has ever devised.

Let us send you our Magneto catalog.

**C. F. SPLITDORF**
Walton Avenue and 138th Street

**NEW YORK**
Branch, 1679 Broadway

CHICAGO
319 Michigan Ave.

SAN FRANCISCO
520 Van Ness Ave.

DETROIT
886 Woodward Ave.

BOSTON
Motor Mart, 220 Pleasant St.

notched, a locking spring engaging the notches, holding the nut in any desired position. In rotating the adjusting nut the spring makes a clicking sound as it engages with the notches and also produces an impulse felt by the fingers, permitting the operator to make the adjustment without the aid of light. This vibrator has a very wide range of adjustment, and owing to the limit stops provided on

The J & B. Type J Vibrator

the adjusting nut it cannot be adjusted to consume more than three-quarters of an ampere of current. This feature renders it impossible to so set the vibrator as to run down the battery. Both contact points can be removed for inspection and replaced without disturbing the adjustment. This vibrator is of the hammer blow type, rapid, flexible and positive in action. Six sizes of the coils are made, ranging in price from $9 to $60 each. The construction of these coils is simple and they are especially recommended for use with high speed engines.

## THE BAKER SPARK PLUG

This plug is made by the Baker Mfg. Co., East and Chapel Streets, New Haven, Conn., and one of the special features is the multiple point central electrode, which, as will be noted from the illustration herewith, is protected by the enclosed end of the plug, the latter being perforated to allow communication between the compression chamber and the plug chamber.

The Baker Spark Plug.

Ignition takes place in the plug chamber and the flame in shooting out through the perforations expels all foreign matter, preventing the accumulation of soot deposits on the spark points

It is claimed that a set of these plugs were tested out on several makes of automobiles, each being given 5,000 miles' running. Oil was fed on the plugs at the rate of one gallon per hour, after which the plugs were disassembled and it was found that the outside of the plug chamber was coated with soot while the inside was perfectly clean.

The price of this plug is $1.50 and it is furnished with all standard threads.

## FEDERAL SPARK COILS

The Federal Mfg. Co., of Lowell, Mass., well known manufacturers of storage ignition batteries, are now also producing a spark coil especially designed for use with their batteries. This coil is said to work on one-tenth of an ampere, this high efficiency being obtained by means of the tortional vibrator, employed, which is the special feature of the coil. This vibrator cannot be easily thrown out of adjustment so as to open the primary circuit alto-

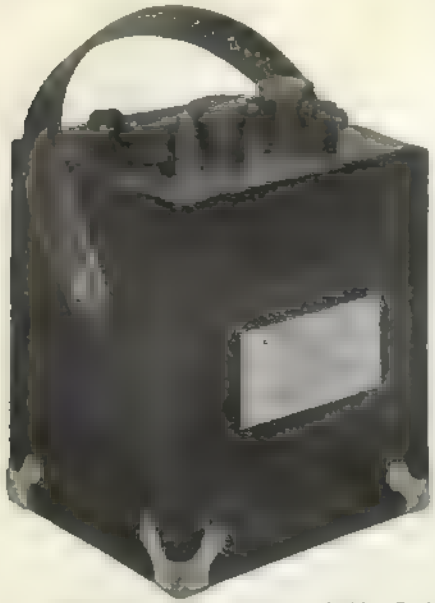
Interchangeable Unit of the Federal Coil

gether or screwed up so tightly that the primary current is unable to produce magnetism to draw the vibrator down, either of which operations would render the coil inoperative. Iridio platinum points are used. The unit cases are of hard rubber which has the advantage of not swelling or warping. The secondary wiring is wound with insulation over every layer. The prices of these coils range from $18 for the single cylinder type, to $100 for the 8-cylinder type.

The Marvel Storage Battery, made by the Excelsior Storage Battery Co., of 14 E. 116th Street, New York City, has been improved in several details for 1909. The cover has been redesigned and is arranged to prevent splashing of the liquid. The new cover referred to is provided with grooves running lengthwise, which fit over the upper edges of the partitions in the case and shut off all communications between the sections of the case. The plate construction of this battery is such that the manufacturers claim that short circuit absolutely will not buckle the plates.

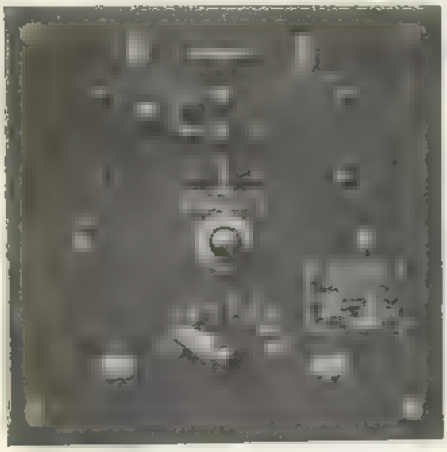
## THE "WESTINGHOUSE" MERCURY RECTIFER IGNITION BATTERY CHARGING OUTFITS

The Westinghouse Mercury Rectifier for charging ignition storage batteries is designed specially for public and private garage use. It is manufactured by the Westinghouse Electric & Mfg. Co., Pittsburg, Pa.



The "Westinghouse" Storage Battery for Ignition Service

As is well known, the mercury rectifier provides a means of converting alternating current into direct current without the use of moving machinery. The Westinghouse Company have been manufacturing current rectifiers for charging vehicle batteries for some time and have lately added this new size for ignition battery charging.



The "Westinghouse" Type E Mercury Rectifier Outfit.

The Westinghouse Type "A" mercury rectifier (the vehicle type) can be readily adjusted for charging any battery and is entirely automatic in its action. It is only necessary to set the regulating dial pointers according to the table on the instruction card on the outfit. The rectifier outfit is cut into the vehicle battery and the primary current supply switch closed. The rectifier is immediately started, and proceeds to supply direct current. No readjustment is necessary during the charging. If at any time the current is interrupted from any cause, the rectifier automatically stops itself. The type "E" mercury rectifier is a small, self-contained rectifier set designed for charging automobile or other sparking batteries. It is similar in principle to the other rectifiers, but is smaller in size and capacity, and is mounted on a small panel which can be bolted to the wall. Particular attention is called to the fact that small floor space is occupied by this rectifier and that the bulbs are entirely protected from mechanical injury.

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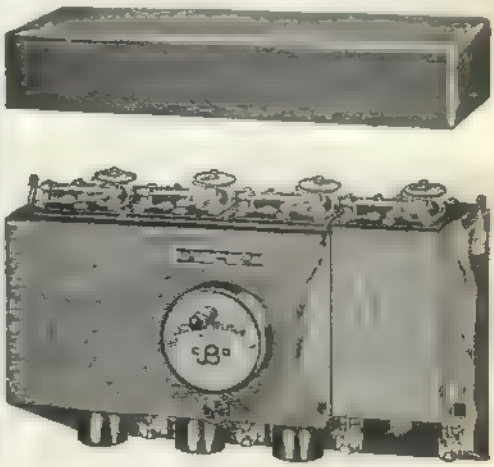
## J. & B. SPARK COILS

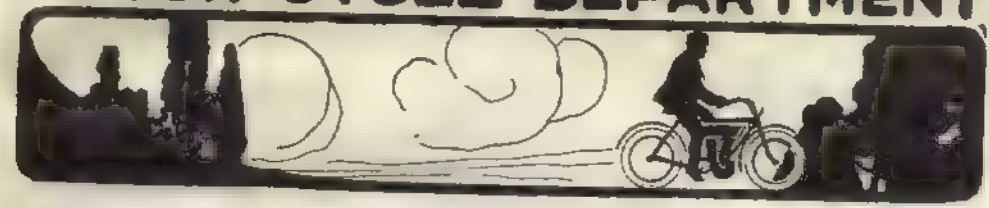
The J. & B. spark coils are made by the Jacobson-Brandow Co., and marketed by the Pettingill-Andrews Co., Pearl Street and Atlantic Avenue, Boston Mass. A special feature of these coils is the vibrator which is shown here in detail. This vibrator employs a new principle of adjustment which is very simple, is claimed to reduce the consumption of current to a minimum, can be accurately adjusted in the dark and is therefore said to be entirely fool proof.



The J. & B. Quadruple Coil, Type J-4

In this vibrator the upper platinum point is mounted rigidly on the bridge member, one end of the bridge member being fastened and the other end arranged to be raised or lowered by means of an adjusting nut. The under side of this nut is

# MOTOR CYCLE DEPARTMENT

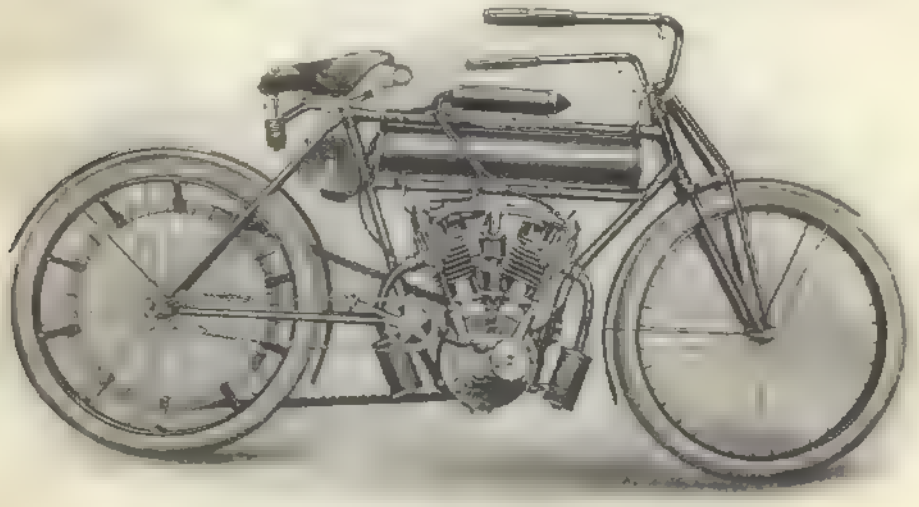


## "HILAMAN" MOTORCYCLES AND VARIABLE SPEED ENGINE PULLEY

The 1909 line of motorcycles manufactured by the A. L. Hilaman Co., of Moorestown, N. J., consists of a 3½ H. P. single cylinder, listing at $225, with magneto $260; a 7 H. P. twin cylinder, illustrated herewith, listing at $285, magneto $40 extra, and an 8 H. P. twin cylinder special price $350, with magneto ignition

around it. The variable speed pulley is a new feature of the Hilaman machine. It is made of high grade steel, gives a ratio of 3 to 1 for high gear and 4½ to 1 for low, and any ratio between the two. It is light and durable and can be changed in 60 seconds, but necessitates dismounting.

The 8 H. P. special is built to order only. Its special features are: Extra low frame, short wheel base, special cylinders cast



The "Hilaman" Twin Cylinder, 7 H. P. Motorcycle. Price, $285.00; with magneto, $40 extra

Very few changes have been made in the new line, and such changes as have been made are only refinements in detail. The heavy flywheels, extra large valves 1⅝ in. diameter, and large bearings have been retained. The only changes on the 3½ H. P. machine are as follows: The crank shaft

The 'Hilaman' Variable speed Engine Pulley

and counterbalance is in one piece, insuring perfect alignment of all bearings at all times. The split end of the connecting rod is secured by cap screws, which are locked with a flat plate fitting the hex. heads, the plate being secured by floating solder

integral with head; 2-inch exhaust valves, cylinder 3 5-16 bore by 3½ stroke, extra amount of radiation on the head. The piston is crowned ⅝-inch, fitted with 3 step cut rings and 5 oil rings. The cylinders are finished in copper plating instead of nickel, to better resist rusting.

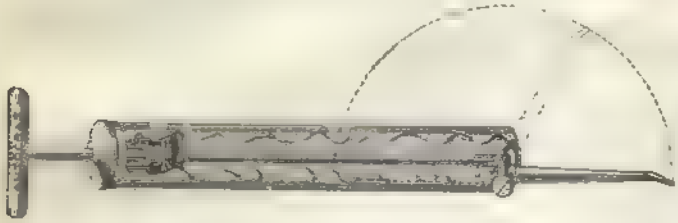
The 7 H. P. model has a 21-inch frame in National Red, 28-inch wheels, 56-inch wheel base, 6-quart gasoline tank and 1-quart oil tank, variable engine pulley and grip control. The weight of the machine is 180 pounds and the speed is 5 to 60 miles per hour.

---

The Reading Standard Co., of Reading Pa., has been working overtime four nights a week for some time past, and since Monday, March 8th, has run on double turn, running the factory day and night. Over 200 people are employed at the present time.

## THE AUTOCRAT OIL GUN

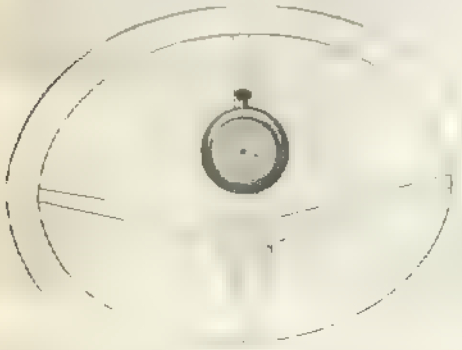
The oil gun here illustrated is manufactured by the American Thermo-Ware Co., 16 Warren Street, New York City. Its distinctive feature is the pivoted spout. When not in use this gun acts as an oil retainer, in which case the handle is screwed out, releasing the piston from the plunger so that the piston can be pushed to the bottom of the gun with the plunger above the oil level. Turning the spout up against the body automatically closes the opening and prevents leakage. This arrangement also minimizes the danger of damage to the spout. Another advantage of this swivel spout is the fact that it admits of the use of the gun in unhandy corners.



The Autocrat Oil Gun

## THE NEVER-MISS AUTO CLOCK

The Never-Miss Spark Plug Co., of Lansing, Mich., are now manufacturing in addition to their line of ignition specialties, the Never-Miss Auto Clock, which is designed for attachment to the webb of the steering wheel where it is of course, easily referred to by the car operator. The case is made of brass, highly polished, and the works are of high grade assuring a perfect time keeper. Price is $3



The Never-Miss Auto Clock

## NEW CLOCKS FOR AUTOMOBILE USE

The accompanying cuts show two of the latest styles of 8-day clocks placed on the market for automobile use by the Motor Car Equipment Co., 55 Warren Street, New York City. The "York" clock is a new product in design and movement, high grade in every respect. The case is heavy polished brass, fitted with a porcelain dial 2¾ inches diameter. There are no projections or obstructions to be broken off or prevent thorough polishing. It can be wound or set without removing from dash and has a new device for attaching, all of which make it absolutely thief, water and dust proof. The size is 4 1-16 inches. It lists at $7.50.

The "Savoy" clock, while embracing the most advantageous features of a strictly high-grade clock, has been further improved with an elegant quick train movement, especially designed to resist constant jar and shaking. The case is highly polished brass, fitted with French porcelain dial 2¾ inches diameter. Because of its even outline and graceful curves, it may be quickly cleaned. The fastening arrangement makes it impossible to detach the clock without the key. All these characteristics combine to make it safe, ornamental and impervious to moisture or dust. It is 3⅝ x 4½ inches in size and lists at $10 00.

The "York" Clock.

The "Savoy" Clock.

## "BOWDEN" WIRE NOW HANDLED BY BRETZ CO.

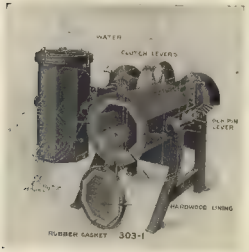
The Bowden wire form of power transmission has been used very extensively for a number of years in foreign countries by motor car and motorcycle manufacturers, and is now also used by a great number of American manufacturers. It is specially adapted for motorcycle and motor car work for the purpose of transmitting reciprocating motion through a tortuous route, as in operating brakes, valve lifters, ignition and throttle controls, muffler cut-outs, auxiliary air controls, etc. The wire may be adapted to impart either a pulling or a

of spur gears connected to bevel gear by shaft with universal joints.

There being a small number of joints and all gears and shafts being large, insures a very steady positive drive of the table in unison with the cutter, which is very essential for accurate work. Usually one only of the spur gears is changed when the number of teeth to be cut is changed. The vertical feed is by means of a pawl and ratchet operated through a reducing gear by an eccentric on the worm shaft. The feed may be changed without stopping the machine by shifting the button on the bell crank at the top of the machine. A trip automatically stops this feed when the hob has finished the gear.

## THE "BAIRD" STEEL BALL TUMBLING BARREL

The accompanying cut illustrates a machine designed for the purpose of imparting a highly polished surface to such articles as small nuts and washers, chains and flat metal or stamped articles of any kind. The articles are in this machine along with steel balls, which burnishes them before plating or polishes them afterwards.




The "Baird" Steel Ball Tumbling Barrel.

The machine is exceedingly simple to operate. The barrels are pivoted near the center of their length and are positively held in the fork shaped bearing in a horizontal or operating position by a lock pin which engages a recess in one side of the barrel near the bottom end.

A slight push on the lock pin lever shown, instantly disengages the pin, when the barrel can be tilted. Simply loosening the cover bolt nuts, and throwing back the bolts, enables the cover to be removed and the barrel can then be instantly tilted or turned bottom up to dump the articles, then reversed and refilled. The entire operation takes but one or two minutes. The barrels are of cast iron, lined with maple wood, which when worn out can be easily replaced, thus preserving the iron barrel. Each barrel is independently driven by a clutch engaging the larger gear, so that one barrel can be emptied and refilled while the other is in motion. A rubber gasket on the cover completely seats the barrel, making it water-tight. After withdrawing the locking pin the barrel can be tilted to any angle for the purpose of examining goods, turned bottom up to dump or reverse to again fill with goods. The specifications of the machine illustrated are as follows: Size of barrel (inside) 10½x24 inches long; clutch pulley 20 ins. diameter by 4 ins. face; floor space, 46 ins. by 57 ins.; and net weight 1300 lbs.

This machine is manufactured by the Baird Machine Co., Oakville, Conn.

## THE "CANTON" PORTABLE HOIST

The Canton Foundry & Machine Company, of Canton, Ohio, is manufacturing the portable floor crane and hoist illustrated herewith.

This device will be found very useful in the automobile assembling room for the purpose of lifting an automobile bodily, either from the rear end or front, and high enough that a man can work under it, or for lifting engines, etc., from the chassis

The "Canton" Portable Floor Crane and Hoist.

and conveying them to any part of the machine shop. It is also used extensively for placing heavy castings between lathe centers, etc.

The peculiar frame construction of this device allows it to go into every nook and crook of a factory, often lifting and conveying heavy pieces in limited space where there is not room for more than one man. It is constructed of cast iron and steel and has roller bearing wheels. This hoist is made in eight sizes. No. 1 has a capacity of 3000 lbs. It is 5 feet 8 inches high and has a 4½ foot lift. The list price is $100. No. 8 which is 12 feet 6 inches in height and has a 11 foot 3 inch lift, lists at $200.

## THE "VANGUARD" SPARK PLUG

The accompanying cut illustrates the particular features of the Vanguard plug very clearly. The plug is built of good proportions, extra heavy insulation being used. The manufacturers, Vanguard Manufacturing Co., of Joliet, Ill., claim this plug to be absolutely proof against fouling or short circuiting by oil, water or carbon.

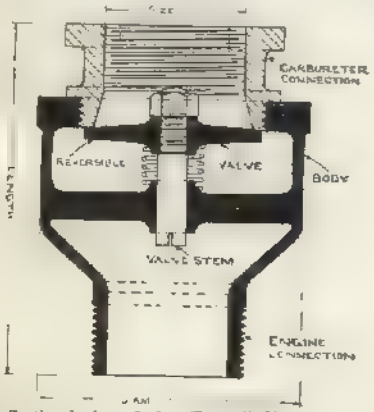
The "Vanguard" Spark Plug.

Extended demonstrations before crowds of visitors at the recent Chicago show have substantiated all the claims made. The company guarantees the Vanguard plug not to quit sparking on account of any kind of fouling matter, and it is sold under this guarantee. The list price of the plug is $1.00

## THE "BREEZE" CHECK VALVE

The Breeze Carburetor Co., 276 Halsey Street, Newark, N. J., makers of the well-known Breeze Carburetor, have placed on the market a check valve made in various sizes to suit carburetor connections.

The check valve, of course, is designed for use with the 2-cycle motor. It passes more gas than pipe size can accommodate




Sectional view of the "Breeze" Check valve.

—requires less lift for valve action, hence quicker acting -reversible valve, metal to metal seat—works either horizontal or vertical—and is claimed not to leak under the heaviest back pressure. The sizes and prices are as follows: ¾-inch, $2 50; 1-inch, $3.25; 1¼-inch, $3 50, and 1½-inch, $4.50.

## THE "CONNECTICUT" VOLT AND AMPERE POCKET METER

The Connecticut Telephone and Electric Co., Inc., of Meriden, Conn., has just placed on the market its new type 1909 dead beat meter for testing batteries. This instrument has many improvements of note over the 1908 style. A new etched metal dial now replaces the paper card dial formerly used, which is not only a handsome addition to the instrument, but adds greatly to its accuracy, also doing away with the common trouble of warping and bulging out, which causes the pointer to stick in taking a reading. The entire interior construction has been changed, and is now made up on the dead beat principle. A new type of pointer construction has also been added.

The "Connecticut" Pocket Meter

The Connecticut Company are making a great many different styles of pocket battery meters. Their volt ammeter is really two instruments in one, the voltage side being used for testing storage batteries, while the ampere side is used for testing the condition of dry batteries.

## THE HARTFORD AUTO PARTS CO. MOVE TO LARGER QUARTERS

The above company report such increased demands for their Universal Joints, especially their Type J, the trunnion block type, which they have manufactured successfully for a number of years, that they have found it necessary to move to much larger quarters. They have taken a lease of the west wing of the Colt's Patent Firearms Factory, 80 Huyshope Avenue, and are beginning to move to this new location, which they claim will give them nearly four times as much space as formerly occupied

The Shawmut Motor Co., which was destroyed by fire at Stoneham, Mass., some time ago, has located in South Boston.

## THE "AUBURN" MICA SPARK PLUG

The Black Hills Mica Company, Auburn, N. Y., has recently placed on the market a new spark plug called the Auburn.

This spark plug is built in two pieces: the mica core and the outside hex. The mica core is built of the highest grade of selected mica, double insulation, capable of withstanding a pressure of 80,000 volts. The outside insulation is built up of mica washers subjected to a pressure of 15,000 pounds. This mica core is built into a

The "Auburn" Mica Spark Plug

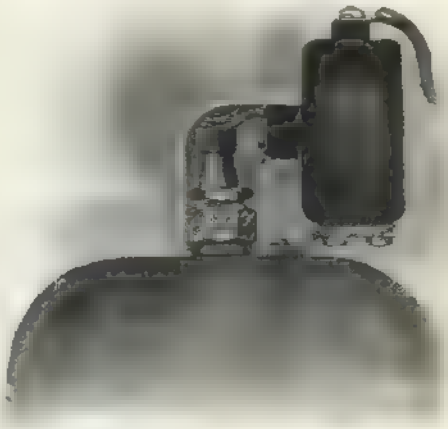
brass bushing, which screws into the outside hex, forming a positively gas-tight joint. The outer hex projects down over the lower part of the mica core, forming a cavity in which there is no circulation of gases, consequently no soot deposits can form on the lower part of the core which forms the insulation medium. The outside hex. is made of the highest grade steel and finely finished.

The magneto type of this plug is the same in every particular with the exception of the electrode wire, which is bent around in the form of a horseshoe curve over the bottom of the central electrode. The spark starts on the free end of this electrode wire and as the heavy current of the magneto eats the metal, as it sometimes does with high grade magnetos, the spark follows around the curve of the wire, thus giving about three-eighths of an inch of metal to be burnt away, which, of course, would take several years of the most severe service.

## THE "SEELEY" IGNITION SYSTEM

The High Frequency Ignition Co., 254-56 Pacific Electric Building, Los Angeles, Cal., has recently brought out a new ignition device which consists of a condenser enclosed in a neat cherry finished hardwood case 4x3x7 inches, and a resonator for each cylinder, sealed in a molded case of tough, fibrous composition of high dialectric quality, heat, oil and water proof, designed to attach to each cylinder in close proximity to the spark plug. These resonators are of cylindrical form, 1½ inches long and 2⅛ inches in diameter.

The system includes a two-point switch and a specially designed timer. The leading feature of the Seeley system is the absence of all mechanical working parts, including vibrators. The spark occurs at the break of contact, hence perfect timing, and each discharge consists of a myriad of sparks produced by electrical oscillation across the gap in a less period of time than is occupied by one mechanical vibration, hence a more thorough explosion of the gas and a consequent fuel saving, or more power with the same amount of fuel.



The "Seeley" Ignition Coil

The dotted lines in the illustration represent a rubber tubing drawn over the secondary terminal and spark plug. This is not necessary, but may be used as an additional precaution in marine work, to prevent any possibility of short circuting by spray or wave. Even without this protection, this coil, it is claimed, will run a motor all day long in a drenching rain and never miss an explosion. The timer used in connection with this system is claimed to run twenty thousand miles without repairs or adjustments. It is fitted with ball bearings, which are of generous proportions and are provided with means for adjustment.

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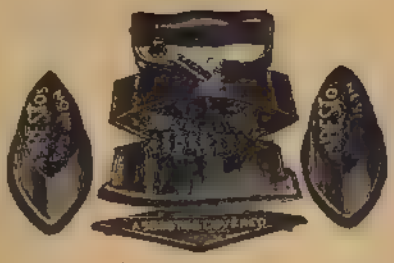
Mr. L. B. Fijux, formerly with the Baker Motor Vehicle Co., is now manager of the Willard Storage Battery Company's Chicago office, and will take charge of the interests in Chicago and the surrounding territory.

# Asbestos Sad Irons

**A Hot Iron, a Cold Handle**

No. 70 Laundry Set

No. 120 Laundry Set

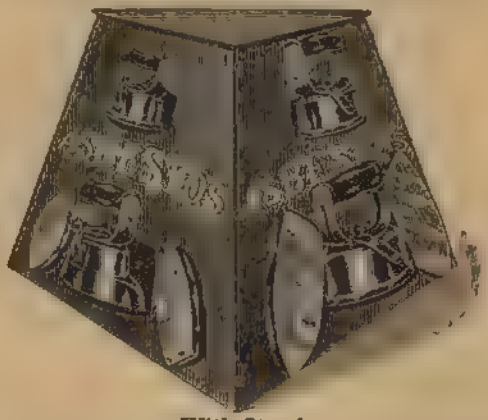


No. 100 Laundry Set

| No. | | Per Doz. Sets |
|---|---|---|
| 60 | Shirt Waist Set | $ 9 00 |
| 66 | French Set | 15 00 |
| 70 | Laundry Set | 24.00 |
| 100 | Laundry Set | 27 00 |
| 120 | Laundry Set | 30 00 |

| No. | | Per Doz. |
|---|---|---|
| 10 | Tourist Iron | $ 3.00 |
| 40 | Sleeve Iron | 6.00 |
| 50 | Flounce Iron | 7.20 |
| 80 | Pressing Iron | 18.00 |
| 71 | Laundry Iron Hoods | 7.80 |
| 82 | Pressing Cores | 10.20 |
| 102 | Laundry Cores | 7 20 |

**ASBESTOS SAD IRON ASSORTMENTS**

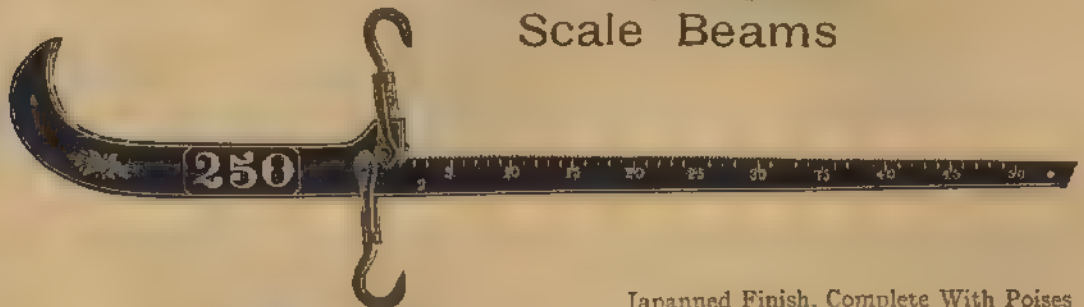


**With Stand**

Set Consists of 3 No. 70 Laundry Sets, 1 No. 100 Laundry Set, 1 No. 120 Laundry Set, 1 No. 80 Pressing Iron, 2 No. 66 French Sets, 3 No. 50 Flounce Irons, 3 No. 40 Sleeve Irons, 6 No. 10 Tourist Irons

| No. | | Each |
|---|---|---|
| 5 | Asbestos Sad Iron Assortment Complete with Pressed Steel Display Stand. One Set in Two Cases, Gross Weight 170 Pounds | $19.15 |

# Scale Beams



Japanned Finish, Complete With Poises

| To Weigh | With Poises | Gross |
|---|---|---|
| 200 lbs. | 1 lb. and 4 lb. | $ 2.60 |
| 250 lbs. | 2 lb. and 8 lb. | 3.00 |
| 300 lbs. | 2 lb. and 8 lb. | 3.50 |
| 360 lbs. | 4 lb. and 8 lb. | 4.00 |
| 400 lbs | 3 lb. and 12 lb. | 4.70 |
| 500 lbs. | 4 lb. and 16 lb. | 5.60 |
| 600 lbs. | 8 lb. and 16 lb. | 6.50 |

**Separate Poises**

| No. | 1 | 2 | 3 | 4 | 8 | 12 | 16 |
|---|---|---|---|---|---|---|---|
| Each | $0 50 | .60 | .70 | .80 | 1.40 | 1.75 | 2.50 |

# Scales

## HAY AND STOCK

**Fairbanks**

With Double Brass Beams

| No. | Capacity | Size Platform | Each |
|---|---|---|---|
| 2114– | 4 Tons | 14 ft.x8 ft. | $180.00 |
| 2112– | 5 Tons | 14 ft.x8 ft. | 210.00 |
| 2110– | 6 Tons | 14 ft.x8 ft. 5 in. | 240.00 |
| 1932– | 6 Tons | 16 ft.x7 ft. 10 in. | 265.00 |
| 1930– | 8 Tons | 14 ft.x8 ft. 5 in. | 290.00 |
| 1930– | 8 Tons | 16 ft.x7 ft. 10 in. | 290.00 |
| 1928–10 | Tons | 14 ft.x8 ft. 5 in. | 315.00 |
| 1928–10 | Tons | 16 ft.x7 ft. 10 in. | 315.00 |
| 1924–15 | Tons | 16 ft.x7 ft. 10 in. | 405.00 |

Beam Boxes furnished at an additional charge of $15.00 each net
Can also be furnished with Single or Comb. Beam

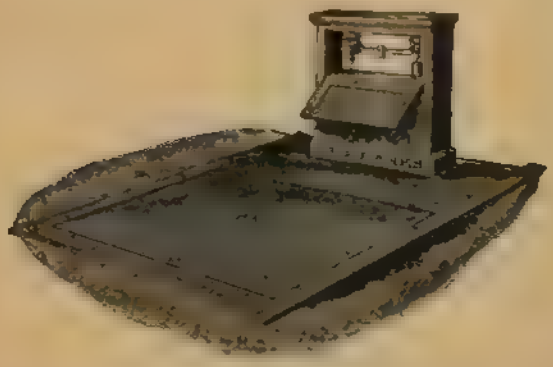
**Victor**

With Double Brass Beams and Beam Boxes

| No. | Capacity | Size Platform | Each |
|---|---|---|---|
| 4814– | 4 Tons | 8x14 ft. | $ 80.00 |
| 5815– | 5 Tons | 8x15 ft. | 90.00 |
| 6816– | 6 Tons | 8x16 ft. | 120.00 |
| 8818– | 8 Tons | 8x18 ft. | 130.00 |
| 9820–10 | Tons | 8x18 ft. | 200.00 |
| 9822–1 | Tons | 8x20 ft. | 220.00 |

Prices are exclusive of the cost of Timber and Foundation which are paid for by Purchaser

## MINERS AND TRANSPORTATION

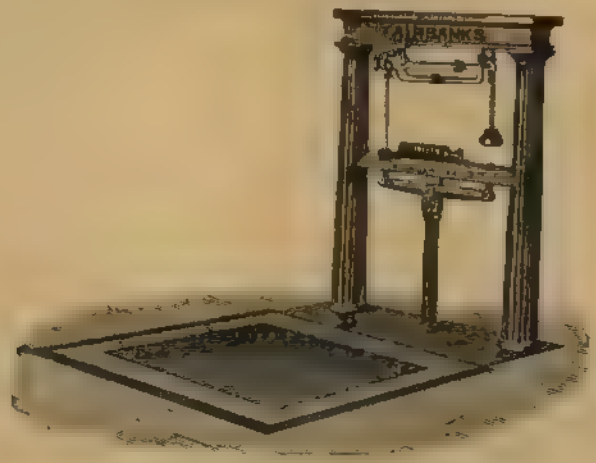


**Fairbanks**

Dormant Pattern are sold exclusive of Timber and Foundation, which are furnished by the Purchaser

| No. | Tons | Platform | Each Sgle Beam | Each Dble Beam |
|---|---|---|---|---|
| 2198– | 2 | 4½ ft.x2 ft. 11½ in. | $115 00 | $123 50 |
| 2176– | 2 | 6 ft.x4 ft. 11½ in. | 135 00 | 143 50 |
| 2192– | 2 | 5 ft.x4 ft. 0 in. | 135.00 | 143 50 |
| 2166– | 3 | 5 ft.x4 ft. 0 in. | 155 00 | 163 50 |
| 2190– | 3 | 6 ft.x4 ft. 11 in. | 155 00 | 163 50 |
| 2188– | 4 | 6½ ft.x4 ft. 10½ in. | 170 00 | 180 00 |
| 2162– | 5 | 7 ft.x4 ft. 9½ in. | 185 00 | 195.00 |
| 2186– | 5 | 5 ft.x4 ft. 0 in. | 185 00 | 195 00 |
| 2184– | 6 | 7½ ft.x4 ft. 8⅞ in. | 215 00 | 215.00 |
| 2158– | 8 | 7½ ft.x4 ft. 8⅞ in. | 240 00 | 250 00 |
| 2156–10 | | 8 ft.x4 ft. 6½ in. | 270 00 | 280 00 |

## DORMANT WAREHOUSE




**Fairbanks**

With Tall Pillar Outfit, Iron Weights

Double Brass Beam

| No. | Capacity Lbs | Platform ft | Platform to Pillars | Each |
|---|---|---|---|---|
| 1050 D B | 2500 | 46x37 | 12 in. | $113.00 |
| 1048 D B–3500 | | 42x44 | 12½ in. | 133.00 |
| 1046 D B–5000 | | 48x48 | 25 in. | 180.00 |

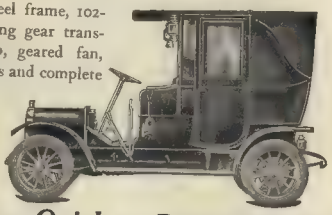
Extra Long Neck

| | | | | |
|---|---|---|---|---|
| 1052 D B–3500 | 42x44 | 20 | in. | 14 |

# Atlas
TWO CYCLE MOTOR CARS

## 20 H. P. *Taxicab* $2350

Seats five passengers—turns in 28-foot space, pressed steel frame, 102-inch wheel base, sliding gear transmission, geared pump, geared fan, geared oiler, 3 oil lamps and complete tool outfit with jack and tire repair kit.



***Progressive Taxicab Companies Are Quick to Recognize the Superior Features of the Atlas***

Let us tell you the reason for the great popularity of Atlas Taxicabs.

It is because of the 2-cylinder, 2-cycle engine with only five moving parts—that is practically indestructible—which so successfully solves the problem for power plant requirements.

Then there are other great advantages—the ample power, remarkable speed variation, the safe and easy control of both engine and transmission—the steering wheel and operating levers mounted on the left side—a decided improvement for safe running in crowded streets.

Garage men are quick to recognize these superior features—that's why they pin their faith to the Atlas.

**Send for Illustrated Catalog and 2-Cycle Catechism**

# ATLAS MOTOR CAR CO.

Members A. M. C. M. A., 92 Birnie Avenue, Springfield, Mass

**1924 Broadway, NEW YORK ∴ Fred H. Adams, Manager**

# The MAXIMUS Makes Motors Mote

Over 12,000 satisfied users. If you are not one of them, you should be; they save your temper, time and money.

PATENTED JUNE 2, 1908

**More Speed**

**More Power**

**Less Plug Trouble**

**Less Coil Trouble**

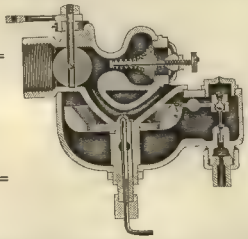
THE "MAXIMUS" TIMER

**We know** we have the best timer made, and that it will improve the speed power and smooth-running qualities of your motor; if it does not, your money will be refunded without argument. 85 per cent. of 1908 model machines are equipped with roller type timers. The Maximus is constructed on the principle of the best of these, but has several improved features that overcome the weak points of roller-type timers, and make the motor mote. A special Maximus, designed to be easily applied to 2-cylinder Buick and Models M and N Ford is now ready for delivery.

The unprecedented success of the Maximus Timer encouraged us to experiment in carburetion, and, after careful testing and improving, we are now ready to offer

## The MAXIMUS CARBURETOR

**Simplified Carburetion**



**List Price**

**1-inch Size, $11.00**

**1¼-inch Size, $12.00**

The principal feature is the improved method of applying both the constant and compensating air. The small opening for the constant air creates a strong vacuum on the nozzle, resulting in throttling to very slow speed and ease in starting. The method of applying the compensating air does away with the sudden increased rush of air on the spray nozzle at change of throttle.

MADE BY

**The BECKLEY RALSTON CO., 80-82-84 Michigan Avenue, CHICAGO, ILL.**

## "AUTOMATIC" BREEZE CARBURETER

**for the Smallest Motors up to Largest Heavy Duty Engines**

Independent adjustments on top in plain sight and handy. Adjustable to any motor—adjustments stay put—wearing parts made large—one-entry continuous supply for fuel and manifold—brass float—positive float feed mechanism—easy starting—control of draught—vaporizer tube correction. Flared nozzle. Valve for economy. Special carburetors for popular motorcycles, Ford Runabout, Buick 10, Durco, etc.

Motor owners ask your dealer for a Breeze Carbureter or Silencer. If he hasn't one write us direct.

**RETAIL PRICES**

| | |
|---|---|
| ⅛ in. pipe size .. | $10 00 |
| 1 in. pipe size .. | 12.00 |
| 1¼ in. pipe size .. | 14 00 |
| 1½ in. pipe size .. | 18 00 |

*Ask or our Descriptive Matter!*

## BREEZE FUEL STRAINER

Easily taken apart. Positive in action and big enough to do the work required. The fuel to be strained runs up through fine meshed gauze under which it darts and water settles and is drained out occasionally. To strain gasoline with a tank is very necessary, but tanks sweat and collect moisture and they cannot control it as with an independent chapter and often loosen dirt in the fuel pipes. The strainer is equipped with drain cock always and with vacuum and tube if desired catches dirt, water, galvanizing, leak rust, loose chips in pipe, etc. To save trouble and be sure of your engine getting a regular supply of fuel insta a good strainer of the Breeze and you can go to the ball game.

Ask for our Descriptive Matter!

The bolts in the cock are furnished in either ¼" or 5-16" for use where it is desired to use the fuel pipe in the strainer. Price $1.50 *on either ¼" or ⅝", pipe size.* JOBBERS and DEALERS Get our Discounts and Handle our Goods. *We furnish electros for catalog illustrations.*

**BREEZE CARBURETER CO., 271 Halsey St., Newark, N J.**



# IS IT A GRAY—

## OR AN IMITATION?

The Efficiency, Appearance and Demand for the

## GRAY MUFFLER

has caused makers of Freakish Catch-Name mufflers to discard their Theories and imitate the Practical and Quiet GRAY.

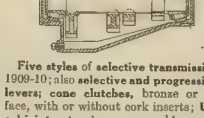
The above shows a Gray model introduced in 1907. Note the cut-out in front head—the collector and tail pipe at rear—note its general appearance and how closely it is NOW imitated.

There's a reason—The GRAY Muffler is Popular. It Sells and gives Satisfaction. All Good articles are imitated, but the Material, Workmanship and Square Dealing which made the Original a Success are not found in imitations. Our 1907 model was right—Service has proven it. Our 1910 is better. It is 3 years ahead of our imitators. Buy the original from the originators and secure the best. The cost is but little more. Write for catalogue, Muffler Department.

**GRAY-HAWLEY MFG. CO.**
**DETROIT, MICH.**
**Motor Car and Motor Boat Accessories**



# B-T-K PARTS




**Five styles of selective transmissions** for 1909-10; also **selective and progressive side levers; cone clutches,** bronze or leather face, with or without cork inserts; **Universal joints; steering gears;** and **brass plating done to order. We make parts to your designs** and are designing new parts for 1910. **We make a specialty of gear cutting** where blanks are furnished.

Write for catalogue and prices.

**Auto Parts Manufacturing Co.**
**MUNCIE, IND.**

# SEE THAT GAP

**One of the Many New Attractive Features Making**

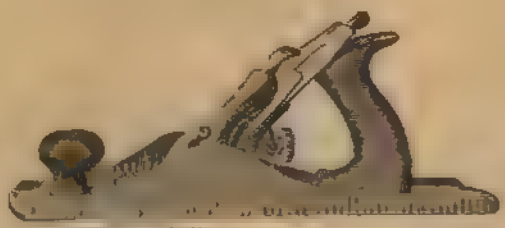
# VASCO WIND SHIELDS

**an ornament and necessity on every car. No Springs. Automatic. One hand control. Take no chances—Buy the BEST. Ask for Catalogue A and prices.**

**Victor Auto Supply Mfg. Co., Inc.**
**42 West 43rd Street, NEW YORK**
**Factory: Providence, R. I.**

# Adjustable Iron Planes

## BAILEY



| No. | | Length | Cutter | Each |
|---|---|---|---|---|
| 1 | -Smooth, | 5½ in. | 1¾ in | $ 1.65 |
| 2 | -Smooth, | 7 in. | 1⅝ in | 2.05 |
| 3 | -Smooth, | 8 in. | 1¾ in | 2.20 |
| 4 | -Smooth, | 9 in. | 2 in | 2.40 |
| 4½ | -Smooth, | 10 in. | 2¾ in | 2.75 |
| 5 | -Jack, | 14 in. | 2 in | $ 2.75 |
| 5½ | -Jack, | 15 in. | 2 in | 3 15 |
| 6 | -Fore, | 18 in. | 2⅜ in | 3 50 |
| 7 | -Jointer, | 22 in. | 2⅜ in | 4 00 |
| 8 | -Jointer, | 24 in. | 2⅜ in | 4 80 |

## BAILEY, CORRUGATED BOTTOM

| No. | | Length | Cutter | Each |
|---|---|---|---|---|
| 4 C | -Smooth, | 9 in. | 2 in | $ 2 40 |
| 4½ C | -Smooth, | 10 in. | 2¾ in | 2.75 |
| 5 C | -Jack, | 14 in. | 2 in | 2.75 |
| 5½ C | -Jack, | 15 in. | 2 in | $ 3.15 |
| 6 C | -Fore, | 18 in. | 2⅜ in | 3.50 |
| 7 C | -Jointer, | 22 in. | 2⅜ in | 4 00 |
| 8 C | -Jointer, | 24 in. | 2⅜ in | 4.80 |

## BED ROCK

| No. | | Length | Cutter | Each |
|---|---|---|---|---|
| 602 | -Smooth, | 7 in | 1¾ in. | $ 2.35 |
| 603 | -Smooth, | 8 in | 1¾ in | 2.55 |
| 604 | -Smooth, | 9 in. | 2 in | 2 75 |
| 604½ | -Smooth, | 10 in | 2⅜ in. | 3 20 |
| 605 | -Jack, | 14 in. | 2 in | 3.20 |
| 605½ | -Jack, | 15 in | 2¼ in. | $ 3.60 |
| 606 | -Fore | 18 in. | 2⅜ in | 3.85 |
| 607 | -Jointer | 22 in. | 2⅜ in | 4.60 |
| 608 | Jointer | 24 in | 2⅜ in | 5.50 |

## BED ROCK, CORRUGATED BOTTOM

| No. | | Length | Cutter | Each |
|---|---|---|---|---|
| 604 C | -Smooth, | 9 in. | 2 in | $ 2 75 |
| 604½ C | -Smooth, | 10 in. | 2⅜ in | 3.20 |
| 605 C | -Jack, | 14 in. | 2 in | 3.20 |
| 605½ C | -Jack, | 15 in. | 2¼ in. | $3.60 |
| 606 C | -Fore, | 18 in. | 2⅜ in | 3.85 |
| 607 C | -Jointer, | 22 in. | 2⅜ in. | 4.60 |
| 608 C | -Jointer, | 24 in. | 2⅜ in | 5.50 |

All Above Packed One in a Box

# Riverside Block Planes

Extra Quality and Finish. Tool Steel Cutters, Warranted

## STANLEY PATTERN

| No. | Length | Cutter | Each |
|---|---|---|---|
| 101–3 in. | 1 in | | $ 0.25 |

| No. | Length | Cutter | Each |
|---|---|---|---|
| 100–3 in. | 1 in | | $ 0.33 |

Non-Adjustable

| No. | Length | Cutter | Each |
|---|---|---|---|
| 102–5½ in. | 1¾ in | | $ 0.55 |

Adjustable

| No. | Length | Cutter | Each |
|---|---|---|---|
| 103–5½ in. | 1¾ in | | $ 0.70 |

Non-Adjustable

| No. | Length | Cutter | Each |
|---|---|---|---|
| 110–7 in. | 1¾ in | | $ 0.70 |

Adjustable

| No. | Length | Cutter | Each |
|---|---|---|---|
| 220–7½ in. | 1¾ in | | $ 0.95 |

## BAILEY PATTERN

With Improved Throat Adjustment

| No. | Length | Cutter | Each |
|---|---|---|---|
| 9½ | –6 in. | 1¾ in | $ 1.60 |
| 15 | –7 in. | 1¾ in | 1.70 |

Nickeled Trimmings

| No. | Length | Cutter | Each |
|---|---|---|---|
| 16 | –6 in. | 1¾ in | $ 1.75 |
| 17 | –7 in. | 1¾ in | 1.85 |

Knuckle Joint Adjustable
Nickeled Trimmings

| No. | Length | Cutter | Each |
|---|---|---|---|
| 18 | –6 in. | 1¾ in | $ 1.85 |
| 19 | –7 in. | 1¾ in | 1.95 |

Screw Adjustment
Low Angle, Nickeled Trimmings

| No. | Length | Cutter | Each |
|---|---|---|---|
| 60 | –6 in. | 1½ in | $ 1.75 |
| 65 | –7 in. | 1¾ in | 1.85 |

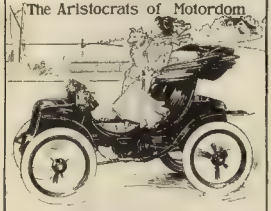
Double End
Has Two Slots and Two Seats for Cutter; can be used either as a Block Plane or Bull Nose Plane in close corners

| No. | Length | Cutter | Each |
|---|---|---|---|
| 130 | –8 in. | 1¾ in | $ 1 00 |

All Above Packed One in a Box

# Baker Electric Vehicles

The Aristocrats of Motordom



BAKER ELECTRICS have given the electric vehicle industry its reputation.

The great Baker factory, devoted exclusively to the manufacture of Baker Electric Vehicles, is the largest of its kind in the world, and employs the most eminent experts in every department of construction.

Baker Vehicles are the height of excellence in equipment, appointments, luxurious furnishings, and that unusual care to details, which makes them the most extraordinary cars in durability, and mileage capacity.

## A Few Baker Features Are

*Unequaled economy in the use of Electric Current.*
*Batteries in series at all speeds.*
*Longest life of the battery.*
*Quiet center-chain drive.*
*Perfect alignment under all conditions.*
*Lowest transmission loss.*
*Exide batteries standard equipment.*

These and many other points of superiority make the Baker the standard of electric vehicles.

## We Want Reliable and Progressive Agencies

in every city where we are not already represented. **Send for Catalog** describing the many popular Baker Models:

Gentleman's Runabout—(*The electric sensation of 1900.*)
Lady's Coupé—(*roomy four passenger car.*)
Queen Victorias, Landaulets, Broughams, Surreys and Commercial vehicles.

**Baker Motor Vehicle Company,**
**35 W. 80th Street, Cleveland, Ohio.**
New York Salesroom, 1188 Broadway.
Chicago Salesroom, 1714 Michigan Av.



THE

# Safety Lock-Switch

for gasoline cars offers to automobile owners absolute protection from theft, tampering and unauthorized use. The lock cylinder itself operates the switch and the key takes the place of the plug.

(Patents applied for)

1. Easy to install.
2. Simple to operate.
3. Neat in appearance.
4. Unfailing in purpose.
5. The best device of the kind on the market and the most inexpensive.

**To be Sold at Retail for $5.00**

Write for Folders and Prices to

## The Britton & Carleton Mfg. Co.

Also Makers of the Safety Lock-Switch for Electric Vehicles

**311-312 Caxton Building**
**CLEVELAND, Ohio**

# A DIFFERENT KIND of ACCESSORY STORE

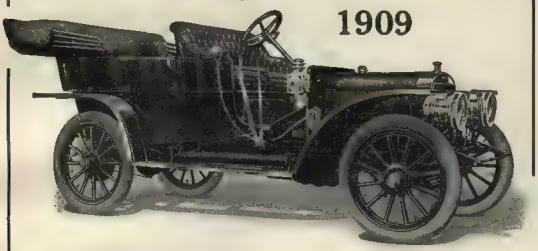
DEALERS, OWNERS AND REPAIRMEN, SEND FOR OUR NEW VOL. 3, 1909-10 AUTOMOBILE ACCESSORY CATALOG. THE MOST COMPLETE BOOK ON ACCESSORIES THAT CAN BE SECURED FOR THE ASKING :: :: :: :: ::

## AUTOLIGHT & MOTOR SUPPLY COMPANY, Inc.

506-8 N. BROAD ST., PHILADELPHIA

Dorris

1909



3-Point Suspension Valves in Head

**Price, $2,500**

DORRIS MOTOR CAR CO. :: :: ST. LOUIS, MO.

# Razors

## BOKER "EMPRESS OF INDIA"

Fully Guaranteed

Round Black Rubber Handles. Hollow Ground.

| No. | Per Doz. |
|---|---|
| 2265–Blade ½ in., Round or Square Point, Crocus Polished | $30 00 |
| 2266–Blade ⅝ in., Round or Square Point, Crocus Polished | 30.00 |
| 2267–Blade ¾ in., Round or Square Point, Crocus Polished | 30 00 |

Embossed Round Black Rubber Handles. Full Hollow Ground. Half Crocus Polished Blade with Gold Etching. File Tang.

| No. | Per Doz. |
|---|---|
| 2238—Blade ⅝ in., Square Point | $9.00 |
| 2250—Blade ⅝ in., Round Point | 9.00 |

Flat, Transparent, Celluloid Handle. Half Hollow Ground, Glazed Blade. File Tang.

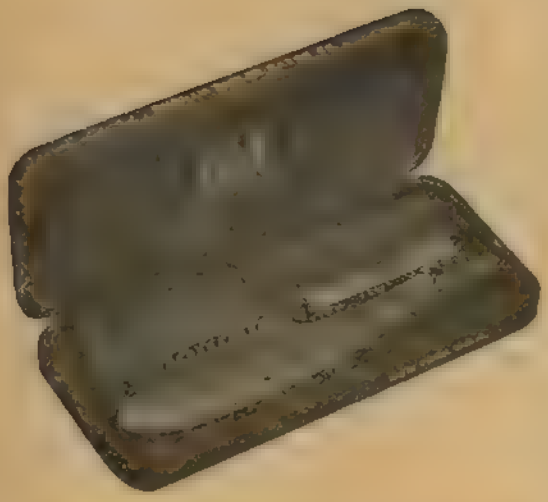
| No. | Per Doz. |
|---|---|
| 2257—Blade ⅝ in., Square Point | $9.00 |

## "MORLEY" CORN RAZOR

| No. | Per Doz. | No. | Per Doz. |
|---|---|---|---|
| 1416 B–Black Rubber Handle | $ 9.00 | 1416 P–Pearl Handle | $18.00 |

# Safety Razors

## DURHAM DUPLEX



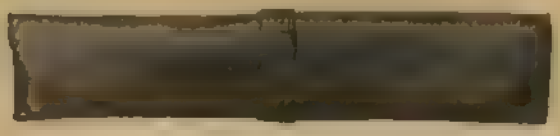
Standard Set consists of Ivory handled blade holder, with [illegible] plated German silver trimming and guard, six double edge hollow ground wafer blades and silver plated German silver stropping and honing attachment. Packed in chamois lined morocco leather case.

Razor may be used either as an ordinary razor or as a safety razor—with or without the safety guard.

Blades may be instantly inserted or removed. Blades with the same amount of stropping that an ordinary razor would receive will last much longer than another double edge wafer razor.

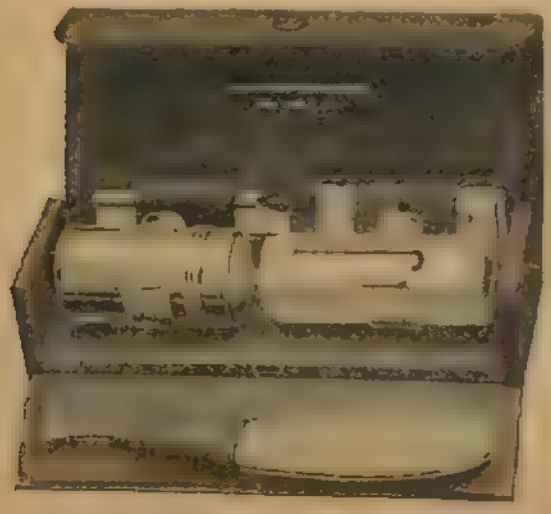
| No. | | Each |
|---|---|---|
| **1**—Standard Set, Silver Plated, Morocco Case | | $5.00 |
| **2** Standard Set, Silver Plated, Pigskin Case | | 6.00 |
| **3**—Standard Set, Gold Plated, Pigskin Case | | 7.50 |

| | Per Doz. |
|---|---|
| **Blades** (½ doz. in package) | $1.00 |



[illegible] Duplex Pigskin Razor Kit consists of one standard razor in pigskin or morocco leather roll, which, when closed, measures one and one-half inches wide.

| No. | | Each |
|---|---|---|
| **1R** | Standard Razors in Green Morocco Leather Roll | $5.00 |
| **2R** | Standard Razors in Red Morocco Leather Roll | 5.00 |
| **3R** | Standard Razors in Pigskin Leather Roll | 5.00 |



# Durham Duplex Hold All Set

In addition to the complete silver plated set, this outfit contains a collapsible "Rubber-set" brush of fine Badger hair and [illegible] nickel plated case.

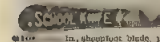
| No. | | Each |
|---|---|---|
| **1HA**—Set complete, in Pigskin Case | | $8.00 |
| **2HA**—Set complete, in Red Morocco Case | | 8.00 |
| **3HA**—Set complete, in Green Morocco Case | | 8.00 |

SEE YA!

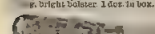
# IMPORTED POCKET KNIVES.

**Strong showing of popular priced goods.** [illegible]

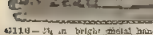
IMPORTED POCKET KNIVES.



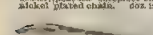

G110—3¼ in., sheepfoot blade, polished and round tang, carved metal handle with letter, bright bolster. 1 doz. in box... Doz. 32c

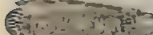


G111—2¾ in. bright metal handle, riveted bolster, polished sheepfoot blade, 1¼ in. nickel plated chain. [illegible] doz. in box. Doz. 38c

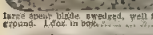


G87—3½ in. stag handle, nickel bolster, bright blade, large spear blade sweged, well finished and ground. 1 doz. in box... Doz. 48c

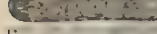




½ in., sheep foot pattern, lettered shield



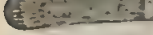

G112—3¾ in. 2 ground blades, steel bolster, lacquered iron lettered handle, 44 in. nickel plated chain. 1 doz. in box... Doz. 70c



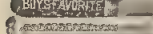
polished steel bolster and cap, 3 in. heavy sheepfoot blade, well polished and ground. 1 doz. in box.

[illegible] y steel blade, double sweden, guaranteed to cut. 1 doz. in box. Doz. 79c

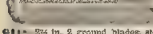
4-3—2¾ in., stag pattern handle, polished bolster, strong sheepfoot, best English steel blade, guaranteed to cut. 1 doz. in box



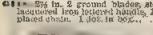
[illegible] handle nickel cap, bolster and shield. 1 doz. in box Doz. 82c



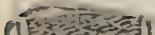
A Low Priced
PEARL HANDLE PEN KNIFE.
*Something extra good for a leader*



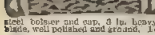
G130—2¾ in., pearl handle, 3 blades brass lined, german silver cap a [illegible] tic. steel, swell and congress shapes 1 doz. in box.
Per dozen, **84c**



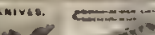
iron, imitation stag handle, steel bolster, 1¼ in. steel chain. 1 doz. in box... Doz. 94c



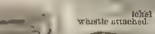
G148—3 in. stag, shell and white celluloid



shield and lining; 2 finished steel blades. 1 doz. in box... Doz. 95c



nickel plated chain, big whistle attached doz. in box... Doz. 97c

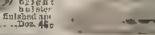


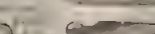
easy opener steel blade guaranteed to cut, genuine steel corkscrew 1 doz. in box... Doz. 89c

white bone handles 1 doz. in box. D

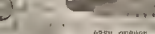
FULL NICKEL PLATED
POCKET KNIFE.
*Showy popular priced number and a money maker.*

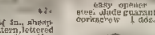
G202—3 in., full nickel plated nickel finish, fancy bolsters, handle stamped with trademark, 2 good steel blades. 1 doz. in box.
Per dozen, **89c**





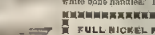
¾ in. pearl handle, floral design, silver bolster, brass lined, 2 full polished blades. ½ doz. in box... Doz. $1.55



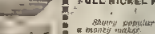


blades guaranteed to cut, steel bolster and lining

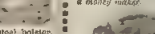
nickel plated chain. ½ doz. in box. Doz. $1.05



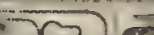
good blades, steel bolster, steel lined. ½ doz. in box



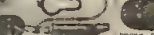
handle, assd. straight pen shield, brass lined blades, full nickel [illegible] $1.00



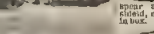
polished steel lined, buff stag horn stag handles. ½ doz. in box Doz. $2.00



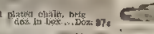
spear and sheepfoot assrt., green shield, coco, ebony and stag handles in box... Doz. $2.00



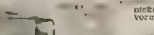
¾ in., assrt. pat., 3 steel blades, nickel finish, clear pearl handle, german silver cap, bolster and lining. ½ doz. in box. Doz. $2.05



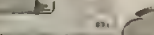
handle, steel bolster, german silver shield, large and blades American finish, and Doz. $2.10



ld, steel lined ebony and doz. in box. Doz. $2.15



steel lined, steel bolster, 2 tempered bl ½ doz. in box... Doz. $



bolster and shield assrt, rosewood and ebony handles. ½ doz. in box... Doz. $2.25

G174—3¾ in., America finish

ver shield, assrt. ebony, stag and dogwood handles. ½ doz. in box... Doz. $2.25

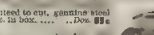
in., assrt. horn stag h ter

cus polished cutlery blades, german silver shield, steel lining and bolster D

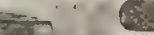
pearl handle, german silver cap, spotter and shield, brass lining 3 doz. in box. Doz. $3.80

FARMER'S OR RANCHMEN'S
CATTLE KNIFE.
*This splendid value is a 40 cent, sooner maker boy—many attachments add to the coco more.*

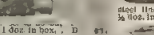
¾ in. cattle knife, stag and ebony handles, spear, spaying and pen blades, brass lined, nickel best german steel, german silver cap bolster and shield. ½ doz. in box. Per dozen, **$3.05**



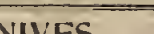
and ivory steel blades, polished cut, brass lined and nickel silver cap bolster and lining and long shield in box... D



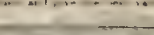
G299—3 in., 3 blade, white pe man silver bolsters, 3 pen blades, 2 medium blades, 2 full crocus blades. ½ doz. in



handles, german silver cap, bolster and shield brass lined, 1 large etched spear blade and one large clip blade. ½ doz. in box. Doz. $4.20

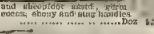


stag handle, german silver bolster, cap and nickel brass lining, 1 large clip and 1 small spear blade, finest steel, full polished and ground. ½ doz. in box... Doz. $4.75



and cocoa handles assrt. steel bolster and lining, 1¾ in. folding cork screw, large clip and spear blades. ½ doz. in box... Doz. $4.40

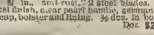
PREMIUM STOCK KNIFE.
*Notice our price on this well known make.*



clip [illegible] steel

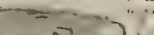
$4.40

IMPORTED BARLOW
POCKET KNIVES.

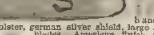


G110—3 in. Shuffield Below heavy blades.

[illegible] handle, lettered steel bolster. 1 doz. in Doz. 46c

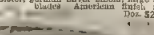


steel bolster. 1 doz. in Doz. 67c



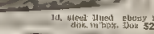
G 274—3¾ in., finish ers, stag hand heavy po [illegible] steel.

screw springs, spear blades, best steel 1 doz. in box... Doz. 89c



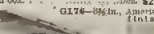
G180—3½ in. American finish, fancy 2 blades, pearl sweed to cut. [illegible] handle, let lered bolster, steel lined, assrt., clip and spear blades. ½ doz. in box... Doz. $1.95

ASSTS. OF PEARL
HANDLE PEN KNIVES.



G196—Full polished and rust finish, white pearl 2 blade pen knives, plain, german silver bronze bolsters and ground. In plush lined box assrt

—Pure white pearl dles, 2¾ in., all 4 and straight patterns, german silver bolster cap and shield, nicely lined, ground steel blades, fine nickel [illegible] black leatherette covered [illegible] clasp, glass cloth lined, sheep and clasp, plush lined, assrt [illegible] back. 1 doz. in case, assrt. Doz. $4.10




COMBINATION
POCKET
KNIFE AND
PENCIL.

[illegible] steel blades, plate handle polished

[illegible] cutter, screwdriver sharpened lead pencil, blade slides into handle so that neither end protrudes. 1 doz. in box 75c

## BOKER'S FAMOUS "TREE" BRAND POCKET KNIVES.

Equal to any make in the world—our point. Finished and put up as well as brands costing you half again as much. Each knife wrapped separate.

### HEAVY JACK KNIFE.

*One of Boker's moderate priced leaders.*

½ doz. in box. Per dozen, **$4.25**

…ly for use. ½ doz. in box. Doz. **$4.25**

…rosewood handles, steel cap and bolster, German silver shield, brass lined, 3 narrow blades, edges polished, cutlery. ½ doz. box. Doz. **$4.40**

…5½ in., carbon cutlery hand cut …ndle, large spear, curtle and pen blades, …lish steel, etched name, German silver …

…man silver bolster, brass lined, large clip blade with fancy plate etching, 2 pen blades, foil crocus finish. Wrapped. ½ doz. in box. Doz. **$3.80**

…"Beauty," 3 in., 4 blades, pure white pearl handle, German silver cap, bolster and shield, full brass lined, 1 medium, 3 pen, 1 nail file blade. Each wrapped. ½ doz. in box. Doz. **$10.00**

…German silver bolster, cap and shield, brass lined clip, tobacco and long spaying blade, full crocus polished, nickeled. Each wrapped. ½ doz. in box. Doz. **$11 50**

## H. BOKER & CO'S FAMOUS "TREE BRAND" JACK KNIVES.

…G1055—Premium stock, congress, cattle and other staple patterns, 3 and 4 blades, sway cocoa and buffalo horn handles, brass lined, German silver bolsters and shield. Each knife perfect, ready for use. 1 doz. in cloth lined display roll. Doz. **$6.25**

## HUNTERS' DIRKS.

…Landers' "Star," 6 in. fore…, welded, etched brand, nickel plated, 1 piece cocoa …

## W. H. MORLEY & SONS "4 LEAF CLOVER" BRAND HIGH GRADE ENGLISH STEEL POCKET KNIVES.

On the market for years—an established reputation with both retailer and consumer. Superior in finish, cutting and general workmanship. All numbers etched with special trademark. We recommend them.

…G901—3¾ in., stag handles, tapering pattern, steel lined, 3 blades. ½ doz. in box. Doz. **$2.00**

…G10—3 in., stag handles, curved pattern, brass silver tips and shield, steel 1 blades, glazed finish, etched. …

…G 2 6 1 …

…MORLEY Knife …um spear …

…arent handle, lettering and emblem. ½ doz. in box assrd. … **$4 20**

…G935—3¾ in., heavy pattern jack, stag and rosewood handles, curved shape, spear pen blade, crocus finish stained, heavy German silver cap, bolster and shield brass lined. ½ doz. in box. ……Doz **$4.25**

…small spear blades, crocus finish, white bone handle, German silver cap, bolster and shield, brass lined. ½ doz. in box……Doz. **$4.25**

…G915—…ed pattern. ½ doz. in box…… …Doz. Out

…G940—3 in., 2 blades, crocus finish, full length …shield, brass lined. ¼ doz. in box Doz. **$4.75**

…G910 …

…crocus polished, milled scale. ¾ doz. in box Doz. **$3.50**

…G635—2½ in. white pearl handle, German silver tips and shield, brass lining, 2 blades, fold ing scissors, full crocus finish. ½ doz. in box…… Doz. **$3.50**

## POCKET KNIFE TOOL KITS.

…G332, "Ever Ready"—3¾ in. heavy cocoa handle jack knife, strong steel blade, also …imitation leather case……Each, **77c**

…G602—"Utica." Heavy 1 blade pocket knife, cocoa handle, German silver bolsters, file, saw chisel and screw driver. All be stitched of heavily steel tool steel, guaranteed. Complete in leather pocket case …… Doz. **$1.50**

## AMERICAN COMBINATION POCKET TOOL

…G10—4½ in., combination knife, star handle, …

## DISPLAY ASST. OF JACK KNIVES

…PIONEER…

…plated chains attached, in partition…

…box. rubber elastic holders. (3 doz. at …Complete, **$1.26**

…knife, white pearl handle, brass lined, full crocus polished blades, star for chain. 1 doz. on card. Doz. **79c**

…WORLD BEATER…

…Verlie," …other sta…

…with 12 in chain and button attached. 2 doz. in easel display case, elastic fastener. (2 doz. at 79c) Complete $ …

…G19 As G72, better quality knives throughout. 2 doz. in easel display case, chain fastened. (2 doz. at 89c) Complete, **$1.78**

…G1915—White bone, nickel plated, stag and fancy metal handles, 5 blades, 3 pr. brass bolsters and shields, assd. patterns, 2 doz. in …

…pictures. (3 doz. at 84c) Complete, **$1.68**
G 1 8 2 …

…and 2 good steel blades …

…new style display card with Amert…Doz. **89c**

…can Flag and Eagle. 1 doz. on card…

…man silver shield 2 doz. in easel display case glass covered, red plush lined, metal corners. (2 doz. at $1.75) …Complete, **$3.50**

…ster, 3¼ …

…turn, 2 doz. …

## KID POCKET KNIFE CASE.

…G00—Flap and…nickel plated buttons, stitched edges, 4 steel…3¾, 3¼, 2¾ …

## JOSEPH ALLEN'S "NON-XLL" SHEFFIELD FARRIERS' KNIFE.

…G1—¾ and 1 in., blades assrd., hand forged, best English steel, natural bone handle, double riveted, strictly guaranteed. ½ doz. in …

## BARBERS' CLIPPERS.

…"PALMER HOUSE" BARBER'S CLIPPER

*A serviceable clipper to offer at a low price.*

…G8 ½ in. cut, standard pattern, tempered steel tooth, full nickel finish, tube coil spring, covered top in box. **46c**

…½ in. cut nickeled plated, tempered steel, hollow …Each, **69c**

…G1163—"Little Giant." ½ in cut, tempered blades …

…heavy steel spring between handles full …

…spring tempered steel cutting teeth, concave bottom. 1 in box …Each, **85c**

…cones, invisible tempered coil …

## PUTTY KNIVES.

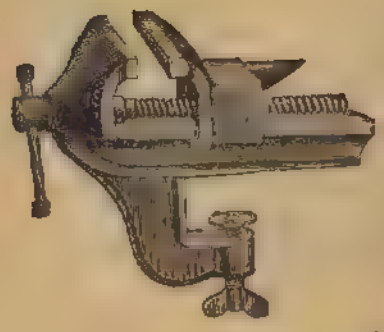
…nickeled handle, closed steel ferrule …Doz. **49c**

…G503—Tempered steel blade stamped brand, polished cocoa…bolo handle, full tang, 3 rivets. 1 doz. in box Doz. **75c**

…G507 …
…tanged …
…ferrule, 3 r…
…ished cocoa handle, full tang, 3 rivets, stamped …ess, in box …$1 10

# Bench Vises

## BONNEYS



Plain Jaw

Swivel Jaw

### Iron Jaws, Solid Steel Screws

| No. | Jaws | Wt. Each | Per Doz. |
|---|---|---|---|
| 1 | –1½ in. Plain | 1¼ lb. | $ 3.75 |
| 1½ | –1¾ in. " | 1½ lb. | 5.00 |
| 2 | –2 in. " | 2 | 6.50 |
| 3½ | –2¼ in. " | 2¾ lb. | 8.50 |
| 4 | –2¾ in. " | 5 | 16.50 |
| 5 | –2¾ in. Swivel | 5 lb. | 19.50 |

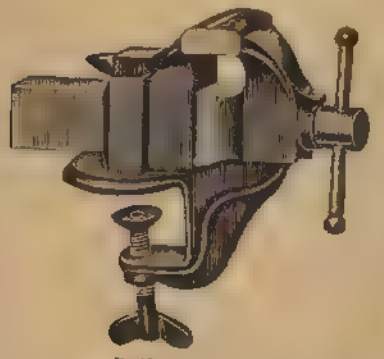
### Steel Jaws, Solid Steel Screws

| No. | Jaws | Wt. Each | Per Doz. |
|---|---|---|---|
| 2½ | –2 in. Plain | 2¾ lb. | $ 9.75 |
| 3 | –2¼ in. Swivel | 2¾ lb. | 12.00 |
| 6 | –2¾ in. Plain | 5 lb. | 19.50 |
| 7 | –2¾ in. Swivel | 5 lb. | 22.50 |
| 8 | 2¾ in. Plain | 5 lb. Swivel Base | 19.50 |
| 9 | –2¾ in. Swivel | 5 lb. Swivel Base | 22.50 |

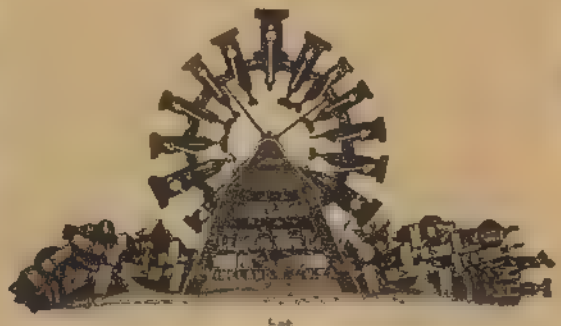
Set–Consists of one Vise each No. 1, 1½, 2, 2½, 3, 3½, 4, 5, 6, 7, 8 and 9 with stand ..... Per Set $15.00

One Set in a Box

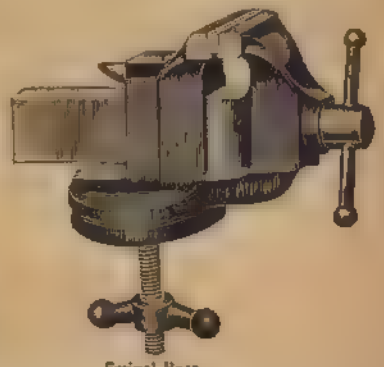
## JERSEY VISES



Stationary



Set



Swivel Base

### Stationary

| No. | Jaws | Wt. lbs. | Each |
|---|---|---|---|
| 40 | –1½ in. Plain Iron | 3 | $ 0.75 |
| 42 | –1¾ in. Plain Iron | 3¼ | .95 |
| 44 | –2 in. Plain Iron | 3½ | 1.15 |
| 46 | –2¼ in. Plain Iron | 4 | 1.50 |
| 48 | –2½ in. Plain Iron | 5 | 1.75 |
| 52 | –3 in. Plain Iron | 8¾ | 2.40 |
| 41 | –1½ in. Steel Faced | 3 | 1.00 |
| 43 | –1¾ in. Steel Faced | 3¼ | 1.25 |
| 45 | –2 in. Steel Faced | 3½ | 1.50 |
| 47 | –2¼ in. Steel Faced | 4 | 1.75 |
| 49 | –2½ in. Steel Faced | 5 | 2.10 |
| 53 | –3 in. Steel Faced | 8¾ | 2.85 |

### Swivel

| No. | Jaws | Wt. lbs. | Each |
|---|---|---|---|
| 56 | –1¾ in. Steel Faced | 3 | $ 1.25 |
| 57 | –2 in. Steel Faced | 3½ | 1.50 |
| 58 | –2¼ in. Steel Faced | 4½ | 1.90 |
| 59 | –2½ in. Steel Faced | 5¼ | 2.35 |
| 61 | –3 in. Steel Faced | 9½ | 3.15 |

### Assortments

| Set No. | Sets, Each |
|---|---|
| 10–18 Vises | $26.26 |
| 12–24 Vises | 36.68 |
| 14–36 Vises | 50.80 |

Sets Consist of, See Below

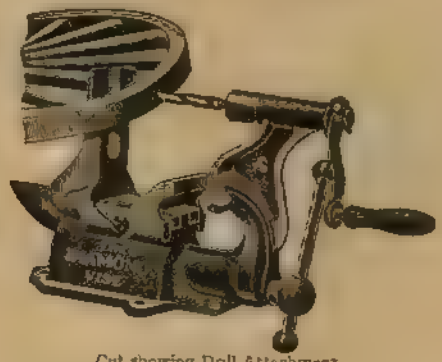
Set No. 10 Consists of 3 each 40, 42, 44, 2 each 46, 48, 1 each 47, 49, 52
Set No. 12 Consists of 4 each 40, 42, 3 only 44, 2 each 46, 47, 48, 1 each 43, 45, 49, 52, 53, 58
Set No. 14 Consists of 6 each 40, 42, 3 each 44, 46, 2 each 41, 43, 47, 48, 52, 1 each 45, 49, 53, 56, 57, 58, 59

# Bench Vises

## CHENEY ANVIL AND VISE

| No. | Face in. | Jaws Width in | Opens in | Wt. lbs. | Each |
|---|---|---|---|---|---|
| 10–4½x2 | 2½ | 3 | 9 | | $ 7.00 |
| 20–6½x3 | 3½ | 4 | 25 | | 9.00 |
| 30–8 x3½ | 4 | 5 | 35 | | 11.00 |
| 40–8½x4 | 4½ | 6 | 50 | | 13.00 |

## DIAMOND ANVIL AND VISE



Cut showing Drill Attachment

### Without Drill Attachment

| No. | Wt. Each | Each |
|---|---|---|
| 120–38 | lbs | $ 6.00 |

### With Drill Attachment

| No. | Wt. Each | Each |
|---|---|---|
| 130–51 | lbs | $ 9.00 |

## OVAL SLIDE

### Stationary Bottom, Steel Faced Jaws

| No. | Jaws, in | Weight each lbs. | Each |
|---|---|---|---|
| 00– | 2 | 8 | $ 2.25 |
| 0– | 2½ | 9 | 2 50 |
| 1– | 3 | 13 | 3.00 |
| 2– | 3½ | 22 | 4.75 |
| 3– | 4 | 30 | 6.50 |
| 4– | 4½ | 35 | 9.50 |

## TROJAN

Stationary Bottom

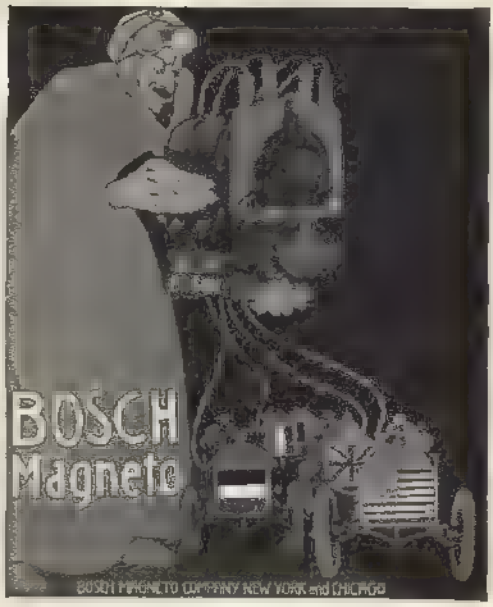
Swivel Bottom

### Steel Faced Jaws

| No. | Jaws | Opens | Wt. Ea. | Each |
|---|---|---|---|---|
| 700–2 | in. | 3 in. | 5¼ lbs. | $ 4.00 |
| 701–2½ | in. | 3¼ in. | 11¾ lbs. | 5.00 |
| 702–3 | in. | 4¼ in. | 24½ lbs. | 6.00 |
| 703–3½ | in. | 4⅝ in. | 28½ lbs. | 7.00 |
| 704–4 | in. | 5¼ in. | 41 lbs | 8.50 |

| No. | Jaws | Opens | Wt. Ea. | Each |
|---|---|---|---|---|
| 720–2 | in. | 3 in. | 6½ lbs. | $ 4 50 |
| 721–2½ | in. | 3¼ in. | 13¾ lbs | 5.50 |
| 722–3 | in. | 4¼ in. | 23¼ lbs | 7 50 |
| 723–3½ | in. | 4⅝ in. | 32¾ lbs. | 8.75 |
| 724–4 | in. | 5¼ in. | 47½ lbs. | 10.50 |

# Manufacturers!
# GET READY




# BOSCH

***The Preferred Magneto***

**Order in time to secure deliveries for 1910!**

BOSCH MAGNETO COMPANY
223-225 West 46th St.
NEW YORK
CHICAGO BRANCH: 1253 Michigan Ave.

# Bristols Recording Gauges

Fig. 1207 A

No
**2096** -Working Range 0 to 120 pounds, Total Scale 0 to 180 pounds; Graduated 5 pounds per square in. Chart Revolves once in 24 Hours. Complete with Ink and 100 Charts..... Each $50 00
**Extra Charts**..... Per 100 1.00
**Ink** 1 oz. Bottles..... Per Bottle .50
1 Pint Bottles..... Per Bottle 4.00

**Gauges for Various Steam, Gas or Air Pressures, Vacuum, Electricity and Temperature.**
**Prices and Information furnished on Application. Write for Special Catalogs**

# Watchmans Time Detector

**IMHAUSERS NEW IMPROVED WITH SAFETY LOCK ATTACHMENT**

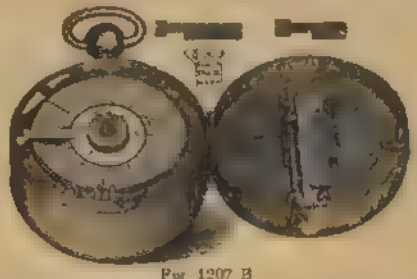


Fig. 1207 B

The marking apparatus in these instruments is placed in the cover of the case separately from the watch movement, which is thereby protected from injury by unauthorized getting in through the key hole. This is a great advantage over other watchmen's clocks, having the marking springs for pricking holes on the dial not separated from the time movements.

No person employing a night watchman will, after examining this Watchman's Time Detector, do without it. No person interested in this instrument will appreciate it so fully as the watchman himself—that is, provided he means to discharge his duty in good faith—as it will clearly show to all interested that he has done so.

Parties purchasing these instruments should test them sufficiently in the office to their entire satisfaction. These Watch Clocks are as reliable as the best lever watch, and are warranted in every case to be in perfect and complete order, and any trusty watchmaker can clean and repair them.

**Complete**-With pouch, box of dials, and 12 different keys for 12 stations.... Each $75.00
**Extra Dials, 365 in a box**..... Per Box 3.00

Send for full description circular

# Thermometers

**Hot Water**

Fig. 1208 A

**Canners**

Fig. 1208 B

**High Grade**

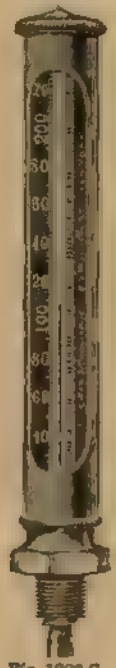


Fig. 1208 C

| Fig. No. | | Each |
|---|---|---|
| 1208 A | Flat, Nickel Plated Case with 6¼ in. Scale Case, Graduated from 40° to 240° Fahrenheit, Threaded for ¼ in. Pipe | $ 5.00 |
| 1208 B | Heavy Triangular Brass Case with vent, 7 in. Scale Case, Graduated from 170° to 270° Fahrenheit, and Pressure Scale to square in 0 to 30 lbs., Threaded for ¼ in. Pipe, Extension 2 in | 12.00 |
| 1208 C | Highly Polished Cylindrical Brass Case with Brass Shield, Scale Case 7 in. Long by 1⅛ in. Diam., Graduated from 20° below zero to 260° Fahrenheit, Threaded for ¼ in. Pipe, Extension 2½ in. | 15.00 |

**Salinometer Hydrometer**

Fig. 1208 D

**Salinometer Thermometer**

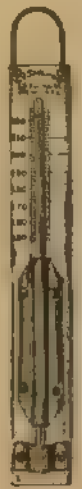


Fig. 1208 E

**Salinometer Pot**

Fig. 1208 F

| Fig. No. | | Each |
|---|---|---|
| 1208 D | Salinometer Hydrometer | $ 1.50 |
| 1208 E | Salinometer Thermometer | 3.00 |
| 1208 F | Salinometer Pot | 4.00 |

# Recording Instruments

8 inch Chart

## BRISTOLS NEW PORTABLE ALTERNATING AND DIRECT CURRENT VOLT METER

The Metallic Frame of the operative part of this Instrument and also of the Auxiliary Resistance which is contained within the case is made of Aluminum. Weight of the entire Instrument and Carrying Case 15 Pounds. Case measures 2½x5¾x17 in. high. Provided with Handle and Leveling Screws for convenience in transportation and adjustment.

| Number | Each | Graduations | Working Range | Total Scale | One Revolution of Chart |
|---|---|---|---|---|---|
| 25100 | $65 00 | 2 Volts above 60 | 20 to 120 Volts | 0 to 130 Volts | 24 Hours |
| 25101 | 65 00 | 5 Volts above 100 | 40 to 225 Volts | 0 to 250 Volts | 24 Hours |

Prices include with each Volt Meter, key, one hundred cards and a bottle of special recording instrument ink

## CASES, CHARTS, ETC.

| | Each |
|---|---|
| Damping Device, (Extra Net) | $5 00 |
| Aluminum Case, 8 in. Chart. Reduced weight, one-half (Extra Net) | 8 00 |
| Carrying Case for Electrical Instruments, Single Compartment | 6 00 |
| Carrying Case for Electrical Instruments, Double Compartment | 7 00 |
| Special 8 in. Chart, graduated to order | 15 00 |
| | Per 100 |
| Additional Charts, 8 in | $1 00 |
| Additional Charts, 8 in. (Copying Ink) | 1 25 |

## SPECIAL RECORDING INSTRUMENT INK

| | Each | | Each |
|---|---|---|---|
| One Ounce Bottles | $0 50 | One Pint Bottles | $4 00 |
| Four Ounce Bottles | 1 20 | One Quart Bottles | 8 00 |
| Half Pint Bottles | 2 00 | | |

# Recording Instruments

**Bristols Standard, 8 inch Chart**

## DIRECT CURRENT, WATT METERS

| Number | Each | Chart No. | Maximum Voltage | Max. Current Amperes | Working Range K lo Watts | Total Scale, K lo Watts | One Revolution of Chart |
|---|---|---|---|---|---|---|---|
| 3000 | $76 00 | 310 | 125 | 48 | 0 to 6 | 0 to 6 | 24 Hours |
| 3001 | 76 00 | 302 | 125 | 48 | 0 to 6 | 0 to 6 | 12 Hours |
| 3002 | 86 00 | 314 | 125 | 120 | 0 to 15 | 0 to 15 | 12 Hours |
| 3003 | 86 00 | 311 | 125 | 145 | 0 to 18 | 0 to 18 | 24 Hours |
| 3004 | 96 00 | 312 | 125 | 240 | 0 to 30 | 0 to 30 | 24 Hours |
| 3007 | 106 00 | 313 | 150 | 600 | 0 to 90 | 0 to 90 | 24 Hours |
| 3010 | 116 00 | 303 | 150 | 1200 | 0 to 180 | 0 to 180 | 12 Hours |
| 3011 | 116 00 | 307 | 150 | 1200 | 0 to 180 | 0 to 180 | 24 Hours |
| 3012 | 76 00 | 310 | 250 | 24 | 0 to 6 | 0 to 6 | 24 Hours |
| 3013 | 76 00 | 302 | 250 | 24 | 0 to 6 | 0 to 6 | 12 Hours |
| 3014 | 76 00 | 314 | 250 | 60 | 0 to 15 | 0 to 15 | 12 Hours |
| 3016 | 86 00 | 312 | 250 | 120 | 0 to 30 | 0 to 30 | 24 Hours |
| 3017 | 86 00 | 315 | 250 | 150 | 0 to 38 | 0 to 38 | 12 Hours |
| 3018 | 96 00 | 316 | 250 | 300 | 0 to 75 | 0 to 75 | 12 Hours |
| 3024 | 76 00 | 310 | 600 | 10 | 0 to 6 | 0 to 6 | 24 Hours |
| 3025 | 76 00 | 302 | 600 | 10 | 0 to 6 | 0 to 6 | 12 Hours |
| 3026 | 76 00 | 314 | 600 | 25 | 0 to 15 | 0 to 15 | 12 Hours |
| 3027 | 76 00 | 311 | 600 | 30 | 0 to 18 | 0 to 18 | 24 Hours |
| 3028 | 76 00 | 312 | 600 | 50 | 0 to 30 | 0 to 30 | 24 Hours |
| 3031 | 86 00 | 313 | 600 | 150 | 0 to 90 | 0 to 90 | 24 Hours |
| 3034 | 96 00 | 303 | 600 | 300 | 0 to 180 | 0 to 180 | 12 Hours |
| 3035 | 96 00 | 307 | 600 | 300 | 0 to 180 | 0 to 180 | 24 Hours |

## ALTERNATING CURRENT, WATT METERS

The Current Coils of these Instruments are wound for Maximum Current of 5 Amperes and the Potential Coils for Maximum Voltage of 125 Volts.

The Instruments may be adapted for other ranges of current and voltage by use of series and potential transformers.

| Number | Each | Chart No. | Graduations, K.lo Watts | Total Scale, Kilo Watts | One Revolution of Chart |
|---|---|---|---|---|---|
| 3200 | $87 00 | 394 | 1-20 | 0 to 2½ | 24 Hours |
| 3201 | 87 00 | 393 | 1 | 0 to 50 | 24 Hours |
| 3202 | 87 00 | 392 | 2 | 0 to 100 | 24 Hours |
| 3203 | 87 00 | 398 | 10 | 0 to 500 | 24 Hours |
| 3204 | 87 00 | 395 | 20 | 0 to 800 | 24 Hours |
| 3205 | 87 00 | 396 | 50 | 0 to 1600 | 24 Hours |
| 3206 | 87 00 | 399 | 50 | 0 to 2000 | 24 Hours |
| 3207 | 87 00 | 397 | 50 | 0 to 2500 | 24 Hours |
| 3208 | 87 00 | 360 | 100 | 0 to 4000 | 24 Hours |
| 3209 | 87 00 | 391 | 5 | 0 to 200 | 24 Hours |

Prices on Alternating Current Watt Meters are without transformers, prices for series and potential transformers on application

All Alternating Current Watt Meters are furnished with damping device.

In ordering Alternating Watt Meters, the following information should be given Phase Single, Two or Balanced Three. Frequency Max. Current, Max. Voltage and Average Power Factor, if possible.

Above prices include, with each instrument, padlock and key, one hundred charts and a bottle of special recording instrument ink.

From factory only

## PORTABLE HOIST AND TROLLEYS

Fig. 331A

Plain

Fig. 331B

Geared

Fig. 331C

Flat Rail

### Brown Patent Steel Trolleys

Four Wheeled—for Standard Light Steel I-Beams

**Plain Trolleys**

| Capacity in Tons | Price | Greatest Distance between Supports | Diameter of Tread of Wheel | Standard Size of I-Beam* |
|---|---|---|---|---|
| | | Feet | Inches | Inches |
| ½ | $20.00 | 14 | 4 | 6 |
| 1 | 25.00 | 13 | 5 | 6 |
| 1½ | 35.00 | 13 | 6 | 7 |
| 2 | 40.00 | 13 | 7 | 8 |
| 3 | 50.00 | 13 | 8 | 9 |
| 4 | 60.00 | 13 | 9 | 10 |
| 5 | 80.00 | 15 | 10½ | 12 |
| 6 | 120.00 | 15 | 13 | 15 |
| 8 | 140.00 | 25 | 13 | 20 |
| 10 | 150.00 | 27 | 13 | 24 |

**Geared Trolleys.†**

| | | | | |
|---|---|---|---|---|
| 1 | $55.00 | 14 | 5 | 6 |
| 1½ | 60.00 | 13 | 6 | 7 |
| 2 | 65.00 | 13 | 7 | 8 |
| 3 | 70.00 | 13 | 7 | 9 |
| 4 | 100.00 | 13 | 9 | 10 |
| 5 | 110.00 | 15 | 9 | 12 |
| 6 | 160.00 | 15 | 13 | 15 |
| 8 | 170.00 | 25 | 13 | 20 |
| 10 | 190.00 | 27 | 13 | 24 |

*Can be altered to suit larger beams.
†Geared Trolleys should nearly always be used for 3 tons and over to facilitate easy movement of loaded trolley along the track.

Fig. 331D

Portable Crane and Hoist.

**Flat Rail Trolleys**

Made to run on flat steel bars

| Capacity in Tons | Size of Rail in | Greatest distance between Hangers feet | Price of Trolleys | |
|---|---|---|---|---|
| | | | Plain | Geared‡ |
| ½ | 2 x ½ | 6 | $12 00 | 30 00 |
| ½ | 3 x ½ | 6 | 12 00 | 30 00 |
| 1 | 4 x ¾ | 6 | 20 00 | 35 00 |
| 1½ | 4 x ¾ | 5 | 20.00 | 35 00 |
| 2 | 4 x ¾ | 4 | 20 00 | 35 00 |
| 3 | 3 x 1 | 6 | 35 00 | 50 00 |
| 4 | 6 x 1 | 8 | 35 00 | 50 00 |

‡The "geared" trolley is fitted with hand chain and sprocket wheel for trolley travel.

**Portable Crane and Hoist**

| Size | Capacity lbs. | Price | Total Height | Lift | Over Hang | Width of Bed Outside | Width of Bed Inside | Length of Bed | Height of Bed | Weight lbs. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ft. in. | ft. in. | ft. in. | ft. in. | ft. in. | ft. in. | ft. in. | |
| No. 1 | 3000 | $100.00 | 6 5 | 4 3 | 2 2 | 2 5 | 1 10 | 2 11 | 1 0 | 600 |
| No. *2 | 4000 | 112 50 | 6 5 | 5 3 | 2 5 | 2 8 | 2 1 | 3 2 | 1 0 | 740 |
| No. *3 | 6000 | 125.00 | 7 5 | 6 3 | 2 8 | 2 10 | 2 4 | 3 5 | 1 0 | 980 |
| No. *4 | 9000 | 150.00 | 8 5 | 7 3 | 2 10 | 3 4 | 2 8 | 4 0 | 1 0 | 1150 |

*Most useful sizes for average shop. We can furnish same sizes with Low Beds 6¼ in. high at same price when so ordered.

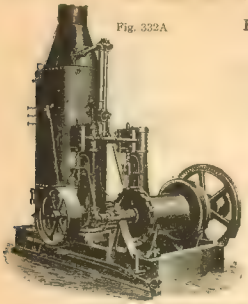


Fig. 332A

## HOISTING ENGINES

Double Cylinder Single Friction

Drum Hoisting Engine

Specifications with Boiler, all Fittings Complete

| Stock Number of Engine | Dimensions of Frame | | Dimensions of Boiler | | | Dimensions of Cylinder | | Dimensions of Drum | | | Length of Hoist of Single Line power per Min | Weight of Pile Hammer | Estimated Shipping Weight complete Pounds | Hoist complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Width Inches | Length Inches | Diam. Shell Inches | Height Stack Inches | Number 4 inch Tubes | Diam. Inches | Stroke Inches | Diam. Flanges Inches | Diam. Drum Inches | Length Between Flanges Inches | | | | |
| 90 | 40 | 87 | 30 | 66 | 43 | 4½ | 5¾ | 20 | 11 | 21 | 2000 | 1500 | 4500 | $500 00 |
| 92 | 42 | 96 | 36 | 70 | 71 | 5½ | 7 | 20 | 11 | 23 | 4000 | 3000 | 6000 | 685 00 |
| 94 | 45 | 105 | 38 | 76 | 81 | 6 | 7 | 26 | 15 | 24 | 5000 | 3000 | 6500 | 750 00 |
| 96 | 47 | 105 | 38 | 84 | 81 | 6¾ | 7 | 26 | 15 | 26 | 6000 | 4000 | 7000 | 899 00 |

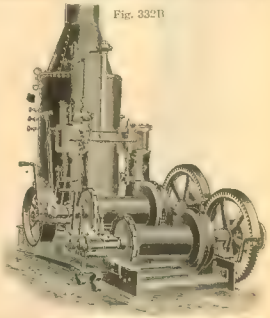


Fig. 332B

Double Cylinder, Double Friction

Drum Hoisting Engine

Specifications with Boiler, all Fittings Complete

| Stock Number of Engine | Dimensions of Frame | | Dimensions of Boiler | | | Dimensions of Cylinder | | Dimensions of Drum | | | Length of Hoist of Single Line power per Min | Weight of Pile Hammer | Estimated Shipping Weight complete Pounds | Hoist complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Width Inches | Length Inches | Diam. Shell Inches | Height Stack Inches | Number 4 inch Tubes | Diam. Inches | Stroke Inches | Diam. Flanges Inches | Diam. Drum Inches | Length Between Flanges Inches | | | | |
| 40 | 40 | 116 | 30 | 66 | 43 | 4½ | 5¾ | 20 | 11 | 21 | 2000 | 6000 | $965 00 |
| 42 | 42 | 132 | 36 | 70 | 71 | 5½ | 7 | 20 | 11 | 23 | 4000 | 7000 | 785 00 |
| 43 | 45 | 135 | 38 | 76 | 81 | 6 | 7 | 24 | 15 | 24 | 5000 | 7800 | 900 00 |
| 44 | 47 | 140 | 38 | 84 | 81 | 6¾ | 7 | 24 | 15 | 26 | 6000 | 8000 | 970 00 |

# Buckeye Incandescent Lamps

REGULAR-EDISON BASE

25 to 130 Volts

Class A

200 to 250 Volts

| Candle Power | Standard Package | VOLTS | | | | | |
|---|---|---|---|---|---|---|---|
| | | 20 to 99 Volts | | 100 to 130 Volts | | 200 to 250 Volts | |
| | | Clear, each | Frosted, each | Clear, each | Frosted, each | Clear, each | Frosted, each |
| 2 | 200 | $ 0 44 | $ 0 49 | $ 0 40 | $ 0 45 | $ 0 44 | $ 0 49 |
| 4 | 200 | 44 | 49 | 40 | 45 | 44 | 49 |
| 8 | 200 | 44 | 49 | 40 | 45 | 44 | 49 |
| 16 | 200 | 44 | 49 | 40 | 45 | 44 | 49 |
| 32 | 100 | 80 | 86 | 60 | 66 | 80 | 86 |

In ordering Lamps, always specify the exact Voltage wanted.

## EXTRA CHARGES FOR SPECIAL BASES

| | Add to Net Price, Each | | Add to Net Price, Each |
|---|---|---|---|
| Westinghouse, Combination Base | $0 06 | T-H Base | $0 06 |

## NATURAL COLORED LAMPS

| | |
|---|---|
| Green and Blue Lamps | 1¾ times the list of plain lamps, of same type, Candle Power and Voltage |
| Purple Lamps, | 1¾ times the list of plain lamps of same type, Candle Power and Voltage. |
| Ruby and Opal Lamps, | 2 times the list of plain lamps, of same type Candle Power and Voltage |
| Amber and Canary Lamps | 2½ times the list of plain lamps, of same type Candle Power and Voltage |

## SUPERFICIAL COLORING

**All Colors** (Dipped in Coloring Fluid) Add 25% to list of plain lamps.

# Buckeye Incandescent Lamps

**EDISON BASE**

Round Bulb Type

**Class "A"**

Tubular Type

## ROUND BULB TYPE

| Candle Power | Standard Package | Diam. Size | VOLTS 20 to 99 Volts Clear, each | 20 to 99 Volts Frosted, each | 100 to 130 Volts Clear, each | 100 to 130 Volts Frosted, each | 200 to 250 Volts Clear, each | 200 to 250 Volts Frosted, each |
|---|---|---|---|---|---|---|---|---|
| 8 | 200 | 2 3/16 in. | $ 0 60 | $ 0 65 | $ 0 50 | $ 0 55 | $ 0 60 | $ 0 65 |
| 16 | 200 | 2 3/16 in. | 60 | 65 | 50 | 55 | 60 | 65 |
| 32 | 100 | 3 1/8 in. | | | 80 | 86 | 1 10 | 1 16 |

## TUBULAR TYPE

| Candle Power | Standard Package | Size | VOLTS 20 to 99 Volts Clear, each | 20 to 99 Volts Frosted, each | 100 to 130 Volts Clear, each | 100 to 130 Volts Frosted, each | 200 to 250 Volts Clear, each | 200 to 250 Volts Frosted, each |
|---|---|---|---|---|---|---|---|---|
| 8 | 200 | 1 1/4 x 5 5/8 | Not made | Not Made | $ 0 60 | $ 0 65 | Not made | Not Made |
| 16 | 200 | 1 1/4 x 3 5/8 | Not made | Not Made | 60 | 65 | $ 0 84 | $ 0 89 |

Extra Charges for Special Bases and Coloring, see Page 1187

In ordering Lamps, always specify the exact Voltage wanted.

45,000 automobiles are being equipped with **Hyatt Roller Bearings** this season

No other bearing can begin to be found in as many cars.

Why?

Because **Hyatt Roller Bearings** are anti-friction bearings.

The load is carried on a line, and not on a point, as with a ball.

Cars built to withstand the rough American roads demand the best.

That's why 45,000 of them are equipped with **Hyatt Roller Bearings** this season.

These bearings are flexible, yet rigid, retain oil for long periods, and cannot get out of adjustment.

Would you know more?

Then write.

**HYATT Roller Bearing Company**

MAJESTIC BUILDING

**Detroit, Michigan**

---

# The Buffalo Carburetor

The one that makes good **under all conditions**, because it is the one that is **scientifically constructed.**

Don't condemn all carburetors because you happen to have an inferior one. Buy a **Buffalo** and learn what a perfect carburetor really is.

It is simple to adjust, economical and powerful in operation.

**Get our printed matter**

**Buffalo Carburetor Co.**

**Buffalo, New York**

# GILL FORGED CRANK-SHAFTS

**The P. H. Gill & Sons Forge and Machine Works, Lorraine and Otsego Streets, Brooklyn, N. Y.** We wish to call the Trade's attention to our Chrome Nickel Steel Crank-Shafts and Gear Blanks, etc., Domestic and Foreign.

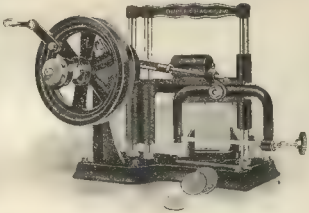
## NO DROP FORGINGS

We have special adapted Crank Pin Machines for making Crank-Shafts true-round within one-quarter-thousandth of an inch. We also make axles complete, finished or forged only; also all kinds of automobile and marine forgings.

Crank-shafts up to 6" dia. All anvil-forged, hammered out of Acid O. H. Steel or Nickel Steel or Chrome Nickel Steel.

# DUPLEX HACK SAW

## HAND AND POWER



¶ The "Duplex" Hack Saw is the only combination hand and power Hack Saw on the market. It can be installed on the work bench and takes up no more room than the ordinary bench vise. It is designed for use in Garages, Machine Shops, Stock Rooms, Tool Rooms, Bicycle and other Repair Shops, etc., etc. It cuts clean, straight and square as a die, with great rapidity and with a minimum degree of labor. While primarily a hand machine, operated by means of a fly or momentum wheel, it can be instantly converted into a powerful, high-class power Hack Saw, by simply attaching a belt to the machine, the momentum wheel being also a pulley. ***Write for Particulars regarding our Free Trial Offer.***

**BUFFALO SPECIALTY CO.,** Address Dept. A, **Buffalo, N. Y.**

**Chalmers-Detroit "30"**
**1910 Model—$1500**

**Touring Car**
**Pony Tonneau**
**Roadster**
**Limousine**
**Coupe**
*Inside Drive*
**Landaulet**

The Chalmers-Detroit "30," 1910 Model, has a 115-inch wheel base. That's three inches longer than our "Forty" of last season. It has 34-inch wheels, against 32-inch last season. Tonneau is more roomy and stylish, the hood accordingly longer and higher.

# To the 800

## Our 1910 Models

**This amazing "30," with all the lines of the most costly cars—showy, roomy, long and luxurious—sells again this season for $1500**

On May 12—right at the season's height the last Chalmers-Detroit "30" of the 1909 model was sold. Since then we have turned away orders for more than 800 cars. Think of unfulfilled orders for $1,200,000 in the first season of the "30."

Our dealers now have our 1910 models on show We fixed deliveries to begin early in August, so you who were disappointed on the 1909 models can get the new ones in the season's infancy. Get your orders in now with your dealer.

### Larger Cars Same Price

For 1910, we are going to give you even more than before for the money.

Our new Chalmers-Detroit "30"—our $1500 car—will have a 115-inch wheel base. That's three inches longer than our 1909 "Forty." It will have 34-inch wheels, two inches larger than last season.

The hood will be three inches longer and two inches higher—in keeping with the larger body. The tonneau will be large and roomy. And not a car on the market, regardless of price, will have a more stylish body.

Our 1910 "Forty" will have 122-inch wheel base—ten inches longer than last season. It will have 36-inch wheels, and room for seven passengers. Our 1909 "Forty" was a five-passenger car. Our new "Forty" will be upholstered in hand-buffed leather, and a Bosch magneto will be furnished free.

Yet, with all these costly improvements, not a penny is added to the price of either car.

### How We Have Done It

Cost of materials has advanced $75 to $100 per car. But we have more than offset this extra cost. We have doubled our factory and increased our capacity by 1,000 cars, which will be produced without a dollar's extra cost for management, for advertising or supervision.

Last year our fixed expense on the "30" was divided by 2,500 cars. This year the same expense is divided by 3,500 cars. That makes a considerable difference per car.

Then our cars are not altered in mechanical ways. This year increasing the bore of our cylinders to four inches and making slight changes in the exhaust valves gives us more power, but we still rate the motor at the same h. p. In the other vital features, there's no possible room for improvement.

So the same tools and machinery will serve for another year. The expense of last season doesn't need to be repeated. Thus we save a great deal. You benefit.

### Nine Per Cent Profit Still

Our profit for 1909 was approximately 9 per cent. Our profit for 1910 we figure will be about the same. Every cent that we save by increasing our output will go into size, finish and style.

In other words, we offset the increased cost by an increased output. That is our permanent policy. Chalmers-Detroit cars will always give the most for the money.

They will always give you every penny's worth

# Chalmers-Detroit Motor Company,

**Chalmers-Detroit "Forty"**
**For 1910—$2,750**

**Touring Car**
**Pony Tonneau**
**Roadster**

The Chalmers-Detroit "Forty," 1910 Model, has a 122-inch wheel base. Ten inches longer than last season. It has 36-inch wheels, two inches larger than last season. It has seats for seven passengers. Upholstered in hand-buffed leather. Magneto free.

# Disappointed

## Are Now On Show

**Note the 1910 "Forty"—a seven-passenger car. Ten inches longer than before—has two inches larger wheels. Yet the price remains $2,750**

of value it is possible to give and retain what would be considered fair profit in any business.

### Extras at Low Cost

Here is an additional policy adopted for 1910; that is, to furnish the following extras at the lowest possible cost—much cheaper than you could possibly buy them unless you bought them from us.

We will fit our $1500 car with a Bosch magneto, a Prest-O-Lite gas tank, and two of the Atwood-Castle new style gas lamps, all for $100 extra. The cost of these extras at regular prices would be $175.

We will furnish our "30" with a Lenox mohair top for $75 extra. This is the very best top you can buy. Don't be satisfied with the ordinary top when you can get a mohair top from us for $75. The regular price of this top is $125.

On our "Forty" the Bosch magneto, the gas lamps and gas tank are all included in the price of $2,750. But we will supply with our "Forty" a $150 Newport mohair top for $125 extra, and we will supply two extra seats—usual price $75—for $50 extra.

### The Records of 1909

The Chalmers-Detroit "30" was a new car only a year ago. One could judge it only by the splendid record of the Chalmers-Detroit "Forty."

Its main prestige lay in the fact that Mr. Coffin designed it—the man who designed our "Forty." But $1500 was a new price—an amazing price. And all the world wondered what sort of car it would buy. Now the records are in.

One of our "30's" has been run more than 32,000 miles, including a path-finding trip from Denver to Mexico City. Never has any car at any price made an equal endurance record. Another stock "30" won the Indiana Light Car race, averaging 51.5 miles an hour for 232.74 miles.

Owners have paid us for repair parts on all cars shipped during year just passed, exactly $2.44 per car. We believe that's another World's record.

In the Economy Test, made in New York by the New York Auto Dealers' Association, our "30" made 25.7 miles on a gallon of gasoline.

Never did a car prove more satisfactory. Never did a car cost so little for upkeep. Mr. Coffin has devoted another year to its study. Yet he has found no mechanical way to improve it.

### Send for New Catalog

Most men find in the Chalmers-Detroit "30" all they want in a car. No price can buy more than we give in our "Forty," save unneeded power.

Send to-day for a catalog. Make your comparisons. Get your order in early to insure prompt delivery. If you buy early you have four or five months' use of the car when the weather is best for motoring, before the car's calendar year really begins. Cut out this coupon now.

*A MEMO TO*

*Chalmers-Detroit Motor Co., Detroit, Mich.*

Please send catalog to

*Name* _____

*Address* _____

*City* _____

*County* _____ *State* _____

Cycle & Automobile Trade Journal, Aug., '09.

**Detroit, Michigan**

*Members Association of Licensed Automobile Manufacturers*

**$3,500.00**
**With Complete Equipment**

# Every Stroke of this Engine Saves You Money

## THE 1910 THOMAS FLYER

**Astonishing Price Great Improvement Great Power**

**UNRIVALLED PERFORMANCE**

**Especially Designed and Constructed to Eclipse Competition and Win Absolute Leadership**

Experts, Chauffeurs and Automobilists are cordially invited to Investigate the New Candidate for Public Favor.

**Six "Long Stroke" Vibrationless Cylinders, Rated at 40 H. P. (4¼" x 5½") Develop 60 Horse-power on the Brake.**

Price, $3,500.00; including superb equipment of Silk Mohair Top, Folding Glass Front, Extra Ignition System with Self-Starter, Hartford Shock Absorbers, Speedometer, Prest-O-Lite Tank, Side Dust Aprons and Pan, Hand Rail, Two Head Lights, Rear Light, Side Lights, Horn, etc., which lists at nearly $500.00.

This makes the Car cost but about $3,000, as Cars are usually sold.

# The Thomas Flyer

## Positively No American Car in the 40 to 50 H. P. Class Can Equal Its Splendid Performance, Because

It is the only American Car in its class that is equipped with the New Extra-Silent Foreign Motor Design, which develops such vastly increased power at same piston speed, viz., Long Stroke Cylinders with very large smoothed gas passages and manifolds, also water jacketed valve stems—the design that has revolutionized motor construction abroad by winning all the 4 inch motor contests, the Grand Prix Race, etc., etc.—and that is also equipped with six cylinders and also has the largest reserve power.

## The Following Facts Are Convincing, But A Demonstration is Proof

The "M" Six Cylinder Motor develops 50 H. P. at 1000 R. P. M. and 60 H. P. at 1400 R. P. M., which is 14 per cent. more power than A. L. A. M. rating which is standard.

Many cars run fast enough, but only cars of highest quality can run slow enough on high gear.

Model "M" will run smoothly as slow as Two miles per hour, slower than a man walks, loaded with passengers, amidst the crowded traffic of city streets on high gear without changing. It is safer, easier and a new and most delightful experience and a performance unrivalled. The surest proof of great reserve power, six-cylinder flexibility and highest motor efficiency.

When desired, model M will run slowly on high gear on bad roads and hills that most cars are compelled to run on lower gear or at break-neck and uncomfortable speed to accomplish on high—another strong proof of great reserve power, six cylinder superiority and high motor efficiency.

The same car loaded with passengers, can run 50 miles per hour on country roads—another proof of great reserve power and high motor efficiency.

Model M develops a speed of 20 miles per hour at only 580 R. P. M., 30 miles per hour at 840 R. P. M., 40 miles per hour at 1120 R. P. M., etc. etc. At the same speed, short stroke motors of same bore require 37 per cent. more revolutions; 37 per cent. more far on bearings, 37 per cent. more vibration, 7 per cent. more wear, 37 per cent. shorter life, 37 per cent. more noise of exhaust and valves; more oil, etc.—another proof of increased motor efficiency, and is proof that there is less vibration, greater silence, smoother running, easier hill climbing and far greater flexibility in the six-cylinder "Long Stroke" motor design.

## All the Latest Foreign Models of Most Popular Make, Include 6-Cylinder "Long Stroke" Motors

Model M includes all well-tried improvements of greatest merit, including latest nickel steel, short case transmission gear; extremely simple control; imported ball bearings throughout; short rigid shafts 8 and seven-tenths inches between centers, unusually quiet and strong. Engine has one-piece construction, large diameter crankshaft, can be removed with fly-wheel as a unit; fly-wheel and all rotating mechanism perfectly balanced, both statically and dynamically; valve plungers cushioned for silence, very large water jackets covering valve stems insures against over-heating and sticking, three-point motor suspension; extra large brakes; very long three-quarter elliptic rear silico manganese springs; two universal joints between transmission and clutch, eliminating strain on bearings, the old reliable Thomas three-disc clutch, patented, low center of gravity, 125 inch wheel base, nickel steel drop frames, extra large bearings throughout, long propeller shaft drive; slight angle dust-proof universal joints, geared force feed oiler, forged axles; clearance 11 inches; hand-hammered aluminum body finest upholstering; wheels and tires 36x4½; workmanship and material guaranteed to be equal to the best.

## There is a Reason

The design was begun in 1907 and the construction in 1908 to group in this one car all the well-tried improvements of greatest merit that have been evolved in various popular cars, for the sole and we trust commendable purpose of eclipsing competition and doing the largest business in the 40 to 50 H. P. class, by giving more power, higher efficiency, better results and more for the money in every way. Two years of patient investigation, designing, testing and improving have been required to complete the task, during which we had the great advantage of participating in and winning the 22,000-mile endurance contest around the world from New York to Paris, a benefit no American competitor enjoys, and also winning thirty-nine other contests and world's records, including the non-stop record of 31 days, 3 hours and 39 minutes on public roads in zero weather; two Glidden Tours (the only ones we entered), also the 150-mile six-cylinder record made at Savannah in 132 minutes and 25 seconds.

**In Touring Cars of Larger Power and Size we have the Great Model F 4-60 H. P.,** an improved New York-to-Paris car, which sells at $4,500 and the greatest of all touring cars; 6-70 Model K fully equipped at $6,000. Model K is equipped with 5 inch tires, also many other improvements. It has the greatest reserve of power of any stock touring car in America, and every owner will back up the statement that the 6-70 Thomas Flyer is the last word in smooth running, hill climbing and all that is good in automobiles.

**E. R. THOMAS MOTOR CO., Buffalo, N. Y.**

Agents Everywhere

Retail Branches

New York: 53rd Street and Broadway

Boston: 288 Columbus Avenue

Chicago: 1323 Michigan Avenue

E. R. THOMAS MOTOR CO., BUFFALO, N. Y., U. S. A.

Please send me your booklet fully describing the new Model "M" Thomas Flyer, and tell me where I can have the car demonstrated to me.

Name

Address

Nov. Cycle and Auto Trade Journal.

# The Team Score Tells the Real Story of the Glidden Tour

"One swallow doesn't make a summer." One car's record doesn't prove much Average performance counts Here is the average score of those makers who entered more than one car for any or all trophies in the 1909 Glidden Tour:

| | Average Penalty | Maximum Penalty against any one car |
|---|---|---|
| 1st Winner of Glidden Trophy | 2.95 points | 10.2 |
| 2nd—MARMON | 8. points | 10.5 |

The next lowest average penalty was 17.58 points, the next lowest maximum penalty against any one member of a team was 34.3 points.

# The MARMON'S Glidden Tour Record

| | |
|---|---|
| Marmon (No. 5) Road Score PERFECT | |
| Marmon (No. 4, Perfect time score, but penalized 8 points for tightening loose connection under gasoline tank. | Penalized by Technical Board. 7.3 points breaking one leaf of a front spring, one bent spring hanger, and stripped thread on one nut. 2.5 points breaking one leaf of a front spring, and one step hanger. |

This is a truly wonderful performance. Nearly 2700 miles over rough country, under conditions which made it by far the most severe test ever undertaken.

Each car was a strictly stock "Thirty-two," each came into every control on time, and each came back with Indianapolis water in its radiator, one quart only being added at Denver as a precaution.

We regret the luck that brought us small penalties for the merest trifles. But our record calls for no apologies. The winner has our congratulations.

*(See Opposite Page)*

# The Marmon "Thirty-Two" for 1910

For 1910, we announce one chassis only, the "Thirty-two." The insistent demand for the "Thirty-two" during the past season has compelled us to give it our entire facilities.

The wheel base has been increased to 116 inches. The motor is now 4 1-2x5 -one-half inch increase of stroke. Body design and construction have been improved. Otherwise, it differs very little from the "Thirty-two" of last season. Imported Bosch magneto. Full Mercedes type honey comb radiator. Imported H. B. ball bearings. Tires, 34x4. Complete high grade equipment. Everything about it is not only good, but the very best there is in materials, design, construction and equipment.

The Marmon is distinctly a manufactured car. Its makers, for over 50 years, have been known the world over as manufacturers of high-grade machinery, and have a well-established reputation as manufacturers of the highest-grade motor cars.

## Territory Going Fast

Much of the good territory for 1910 has already been taken by some of the best known American dealers. Marmon agencies are in great demand. Speak up early.

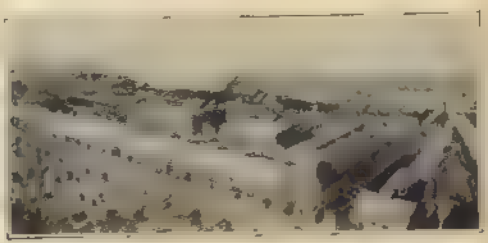
**Nordyke & Marmon Co.**

(Estab. 1851) Indianapolis, Ind.

*Standard Mfrs.*

*A. M. C. M. A.*

## Where the Marmon is Made



Dealers and others are invited to inspect the capacity and facilities of this factory. Anyone who once sees the way the Marmon is manufactured will fully understand its noiseless efficiency, mechanical worth and great durability.

**The "Thirty-two" for 1910**

Touring Car, Suburban or Roadster, fully equipped **$2650**

## THE "METZGER MOTOR CAR CO."

Articles of incorporation were filed in Lansing, Michigan, on September 20, 1909, for a new corporation to manufacture automobiles, to be known as the "Metzger Motor Car Co.," having a capital stock of $500,000, of which $300,000 is paid in. Stockholders and officers in this company are Byron F. Everitt, President; William Kelly, Vice-President, and William E. Metzger, Secretary and Treasurer. This company will manufacture a new car designed by William Kelly, who has been designing since 1899, and was the designer of the E-M-F. Messrs. Everitt and Metzger are well known to the automobile public and automobile trade in general, and were the Everitt and Metzger of the Everitt-Metzger-Flanders Co., up to the time they sold their interests in this corporation to the Studebaker Mfg. Co., on May 1 last.

Mr. B. F. Everitt, familiarly known as "Barney," becomes the President of the new company, a similar position held by him in the now famous E-M-F. Co. Mr. Everitt was probably better known in the manufacturing field, being connected with another large industry producing parts utilized by many of the leading makes of machines. Mr. Everitt's personal acquaintance with the steel and machinery manufacturing interests make it possible for the new company to secure all necessary material promptly and in any quantity.

There is probably no individual identified with the automobile industry from the Atlantic to the Pacific who is better known than William E. Metzger. He was one of the very first to enter the automobile industry in the nineties. It is understood that word passed along by his numerous friends that he had intentions of again embarking in the automobile manufacturing field, brought in between 200 and 300 applications from established dealers to take on the agency of any machine he should see fit to make.

The new company will manufacture a runabout and a 5-passenger car, to be sold at a popular price. The models of this new car have been on the streets of Detroit for some time, and we herewith show a photo of one of them.

The new company purchased the plant of the Jacob Meier Co., trunk manufac-

The Detroit Factory of the new "Metzger Motor Car Co."

One of the new models which is being made in large quantities by the Metzger Motor Car Co., of Detroit. Specifications are for royal blue [illegible] with 110 inch wheel base tire dimensions 34 by 3½ inches, self-adjusting and expanding brakes on both rear wheels, 30 horse power four cylinders, arranged vertically under hood, cast en bloc, 3½ inch bore and 4¾ inch stroke, water cooling with vertical tube radiator, dual spark ignition, with dry battery and magneto; shaft drive, selective sliding gear transmission on rear axle three speeds forward and one reverse.

turers, located at Milwaukee avenue and the Grand Trunk Railroad, Detroit. This plant is well situated for the automobile business and occupies two and one-half acres of ground.

The machinery is being installed and the company will commence delivery of its new product within a short time. It is expected that during the year of 1910 at least 5000 automobiles will be manufactured by this concern.

NEW FEATURES.

The car has many new features, all of which have been carefully worked out by some of the most experienced men in the automobile business. The steering arms and knuckles are raised to the level of the front axle, giving the maximum of clearance, the rear springs are of a new design, two semi-elliptic arranged in the form of a full elliptical, so that the tonneau rides with the greatest ease, the dash arrangement is new and gives a demi-tonneau and roadster type of a particularly racy appearance. On the whole, the new car is as handsome as any of its type on the market.

The price, on which the makers have not fully decided, will be somewhere between $1,250 and $1,400. This will include a full lamp, generator, magneto and tool equipment.

## RESULTS OF NEW JERSEY CLUB'S MEET

Over 5,000 spectators attended the Fall Meet of the New Jersey Club, at Olympic Park, Newark, Sunday, October 10th. Walter Goerke broke the track record twice and captured four of the nine events run off. The first time he broke the track record was during the seven-mile event when he averaged 1.15 per mile. A good showing was also made by Howard O'Brien on a 4 H. P. Indian. He captured the three-mile open and the three-mile scratch, for club members only.

The summaries of the winners and best times follow:

Three mile open. Won by Howard O Brien (Indian). Time, 4 11.

Five-mile handicap (48 50) Walter Goerke (Indian); 6 13 1

Miss-and out (48 50)—Walter Goerke (Indian); 4.33 1-5

Match race (one mile)—Won by K. Moore (Excelsior); 1.42 1 5

Seven-mile handicap (48 50) Walter Goerke scratch (Indian); 8 46.

[illegible] —Howard O'Brien (Indian) 3-5

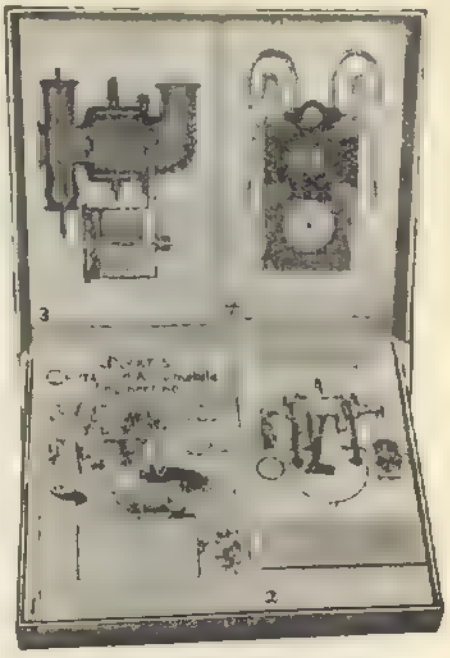
Ten-mile handicap (48 50) -Walter Goerke (Indian), 12 24 4-5.

Five-mile scratch (48.50)—Won by Percy Drummond (Indian); 7 24 2-5

Two-mile match race—Won by A G Chapple (Indian), 38 3-5 The distance of this event was four laps, or two miles.

## DYKE'S COURSE OF AUTO & GASOLINE ENGINE INSTRUCTION

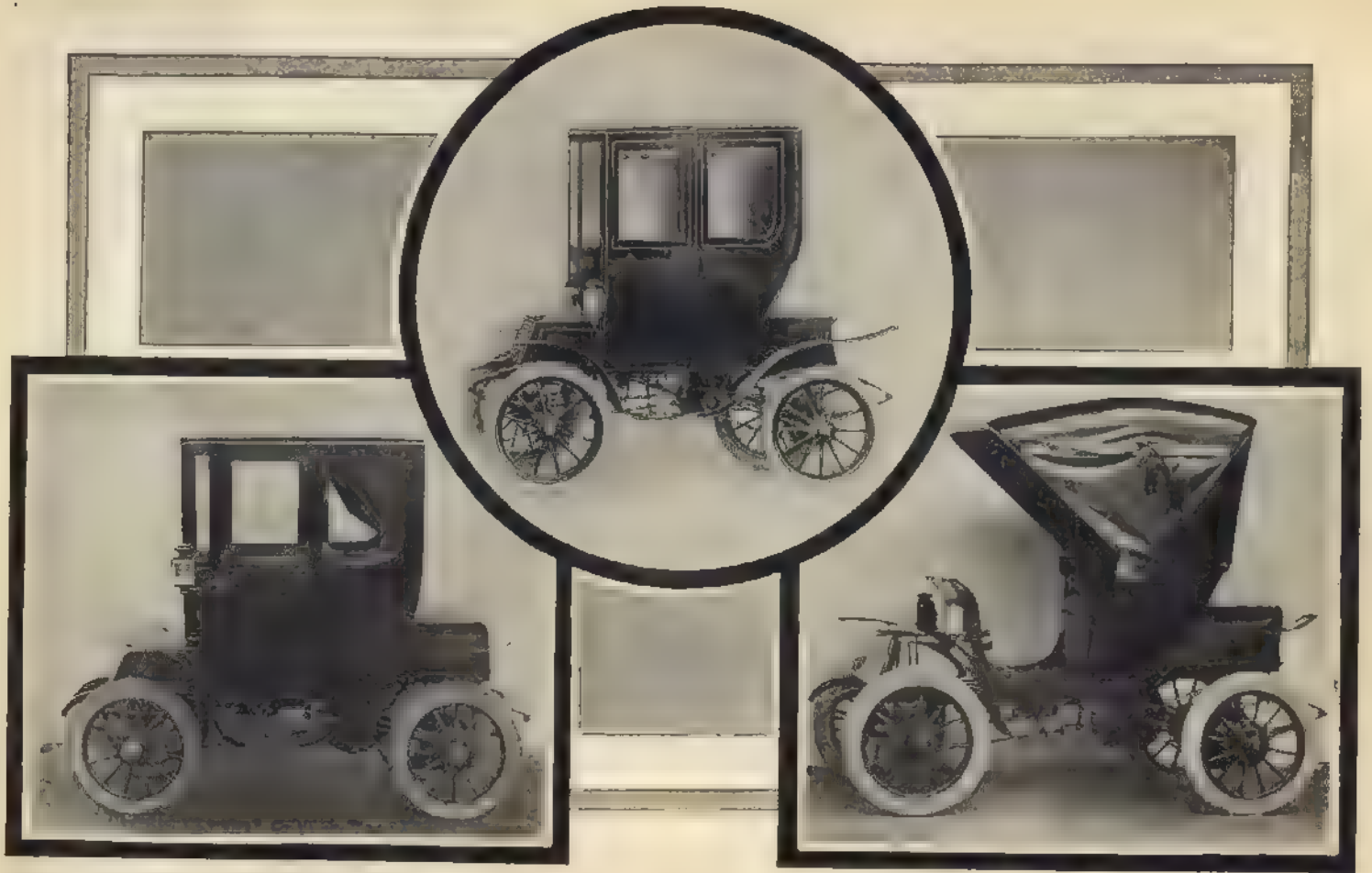
The accompanying cut illustrates the revised course of automobile instruction issued by Dyke's Correspondence School of Motoring, 1400 Bank Commercial Bldg., St. Louis, Mo. In a former issue of the Journal we described the principals of the working models supplied with this course, the recent addition made being in the shape of working model of the carburetor, the same being shown in the upper left hand corner of the cut. The course is novel and unique. It consists of working models which are made up of heavy card board with a complete view on one side and sectional view on the other side. The course consists of 24 lessons.



Dyke's Automobile Instruction Course

**W. F. Maguire,** manager of the Consolidated Mfg. Co., of Toledo, Ohio, has resigned to go with the Ford Motor Co., of Detroit, Mich. He will enter on his new duties on the first of November.

Dr. Frederick A. Cook's arrival in Boston, where he was met by a Thomas car driven by C. S. Henshaw of the Thomas Branch. While in Boston the noted explorer lectured at Symphony Hall.



A group of new Studebaker Electric Models. 22 F Coupe at the top and two entirely new models, 17 B Coupe at the left, $2 200, and 17 D Victoria at the right $1,850 complete with top

## NEW STUDEBAKER ELECTRIC MODELS

Herewith are shown views of some of the latest Studebaker Electric models, built by the Studebaker Automobile Co., of South Bend, Ind. These models are a coupe shown at the top of the accompanying cut and known as Model 22 F, the Model 17 B Electric Coupe, shown at the left, and Model 17 D Victoria at the right. These new models are not spoken of as 1909 or 1910, as it is the policy of this company to adopt refinements and improvements as fast as can economically be done, irrespective of the calendar months. The two Models 17 are entirely new, while 22 F is a continuation along somewhat different lines of a former model.

This model weighs complete, including the top, 1190 lbs., its wheel base is 67 ins. and it can turn in a minimum circle of .1 ft. diameter, the gauge is 53 ins. and steering is by side lever. The wheels are fitted with 30 by 3 in. Electric special tires at the front and 30 by 3½ in. at the rear. The springs are semi-elliptic at the front and full elliptic at the rear.

The motor is suspended from the frame of the body and is of Westinghouse manufacture, being rated as 40 volt, 24 amp. It is mounted on Hess-Bright ball bearings throughout and the axles are also ball bearing. A constricting brake is provided on the armature shaft drum and two sets of contracting brakes are fitted on the rear axle, both being operated by pedals. A 24-cell, 11 P. V. exide battery, 8 cells being placed in the front and two divisions of 8 cells each in the rear supply the current. The front battery compartment is 14⅛ by 27⅝ by 13¾ deep and the rear compartment 19⅛ by 27 by 14 deep. This battery can be charged with a minimum voltage of 62.5 and a charging circuit of at least 37½ amperes.

The body dimensions are as follows. Extreme width, 60½ ins.; length over all, 104 ins.; height, 85 ins.; this gives a seat width inside of 39 ins., by 17 ins. in depth with 22 ins. leg room. The height of the seat from the floor is 16½ ins. and the extreme inside height is 56½ ins.

This coupe belongs to the cheaper line of vehicles and is essentially a two-passenger car adapted particularly to family use and is convertible. The body can be readily taken off during the summer and fall months and put on again during the winter and early spring.

MODEL 17 B COUPE

This entirely new Studebaker coupe is of the extension front type, large and roomy, capable of seating four passengers inside, is high grade in every respect and sells for $2200.

The extreme length over all is 107½ ins. and the height is 84 ins. There is 24-inch leg room and the seat width is 42 ins. and 19¼ ins. in depth.

The battery consists of twenty-six 11 N. V. exide cells, 2 groups of 5 cells each being placed at the front and 2 groups of 8 cells each at the rear. The batteries and trays weigh 970 lbs. and the complete vehicle weighs 2450 lbs. The minimum charging voltage essential is 67 75, while 28 amperes are used for charging at the start and 42 amperes is the minimum which should be available on the charging circuit.

A 48-volt, 26 ampere, Westinghouse motor is suspended from the chassis frame and regulated by a Studebaker continuous torque controller, having four speeds and shunt forward and three speeds reverse. The motor is mounted throughout on F. & S. annular ball bearings. A constricting brake on the armature shaft drum is operated by the controller handle and the internal expanding brakes on the rear wheels are operated by pedals; steering is by side lever.

This coupe has a wheel base of 71 ins., gauge 48 ins., and turns in a circle of 31½ ft. diameter. The tires are 30 by 3½ Electric Special front and rear. Semi-elliptic springs are used at the front and full elliptic at the rear as on the other two models

The Phaeton is built on practically the same chassis as the 17 B coupe and needs no separate description. It differs, however, in having a small child's seat for carrying a third person. It is fitted and trimmed in a very careful and painstaking manner and sells complete, with top, for $1850

## GOOD ROADS CONVENTION AT CLEVELAND IN SEPTEMBER

The Second Annual National Good Roads' Convention, under the auspices of the American Automobile Association, the National Grange, the U. S. Office of Public Roads, and the American Road Makers' Association, will be held at Cleveland, Ohio, September 21st to the 23d. Its advantages as a demonstration point are being clearly recognized by motorists and good road engineers throughout the country, and the delegates preparing to attend the sessions will be not only larger in number but also more representative in character than was the case a year ago in Buffalo

## E-M-F COMPANY BUYS FORGING CO.

Following the purchase of the big De Luxe automobile factory at River and Clark Streets, recently announced, it is now stated that the E-M-F Company has purchased the entire property of the Western Malleable Steel & Forge Company adjoining the De Luxe property.

# Philadelphia's Motorcycle Police Squad

Philadelphia, today, has, we understand, a larger squad of motorcycle police than any other city in this country, and to the best of our knowledge it was the first city to adopt motorcycles for police work.

In 1905 Officer Geo. W. Fritz was promoted to Sergeant of the bicycle squad and about eight different makes of motorcycles were sent to the department on trial. He tried out all of these machines, at the same time instructing the men in their use. The result of all the trials was the adoption of the Indian and the subsequent increase of the size of the squad, until now it contains 42 men, 30 of whom ride motorcycles and 12 bicycles. The first machines were all equipped with G. & J tires, but when the new models were ordered, Morgan & Wright tires were specified. In the early part of this year thirty new machines were bought and the old ones returned to the manufacturers. In speaking of the old motorcycles Mr. Walter Gilbert, Chief Clerk in the Bureau of Police, claimed that after their 3 years of hard service, and they were used every day of that time, they were in first class condition and every one in running order. The new machines are 1909 loop frame, 3½ H. P. single cylinder Indians and cost, fitted with Bosch magneto and Morgan & Wright tires, $250 each. Aside from these two special features the machines have all standard equipment. They are enameled royal blue and on back of the front mudguards are lettered "Police Department" in gold. The manufacturers have agreed to keep the machines in repair for one year.

The cycle squad of the Philadelphia Police as it is to-day. It consists of 42 men, 30 of which have motor cycles. Philadelphia, it is said, has the largest number of motorcycle police of any city in the United States.

### THE SQUAD'S ROUTINE AND METHODS.

The force is divided into two squads, one under Senior Sergeant Fritz, and the other under Sergeant Jacoby. One squad is on duty from 8 A. M. to 4 P. M. and the other from 4 P. M. to 12. The shifts are changed weekly. Two members of the force have been detailed to duty as mechanics and stay at the City Hall at all times and do the repair work. The cleaning of the machines is done by two laborers.

### THE WORK OF THE FORCE.

The work of the motorcycle force is somewhat varied. Their chief duty is to keep the autoists in check and arrest any offenders of the laws regulating automobile traffic. For this purpose the machines are all equipped with Jones' speedometers. The officers are also used for messenger service during parade, riots, etc. When a riot occurred recently in South Philadelphia over 200 regular policemen were advised of it in 8 minutes. At the time of the P. R. T. Co. car strike recently, there was a motor policeman at every car barn in the city and their services proved invaluable. It is claimed there was only about one disturbance during the whole strike, at which the motorcycle force was not represented. For heat or accident cases the men are especially useful in summoning ambulances, etc.

### TERRITORY COVERED.

The men cover about 30 miles per day at a cost of about 9 5-7 cents. Their territory includes every place inside of the city limits, north, south, east, and West Philadelphia, Frankford, Bridesburg, Holmesburg, Tacony, Logan, Oak Lane, Germantown and Chestnut Hill.

### DISPATCH DUTY.

Two members of the squad on duty are detailed each day to remain at the Hall for special dispatch duty, for scouting around the city looking for a stolen car or for the purpose of communicating with the other men on duty. In the case of an auto being stolen these two men are started out in different directions to notify the other men in their squad, who, in turn, visit every garage in their district, the scouts meanwhile going on to the next of

ficer. After notifying all the motorcycle police the two scouts scour the city again and again until the car is found or its departure from the city assured.

The officers report for duty and have roll-call at City Hall, where the machines are kept in a small room, about 10x40 feet, located to the right when one enters the east entrance. It is expected and hoped that in the near future the Bureau of Police will make the motorcycle force a separate district and furnish it with a station where it will have sufficient room to have the necessary offices and a repair shop large enough to install a lathe and such other equipment as may be necessary.

While on duty each man reports hourly through a box to the station of the district in which he is assigned. When his day is over he turns his machine in at City Hall, so there is no "joy-riding" while off duty. There is a gasoline station established in every man's district where a five-gallon can is kept as a supply.

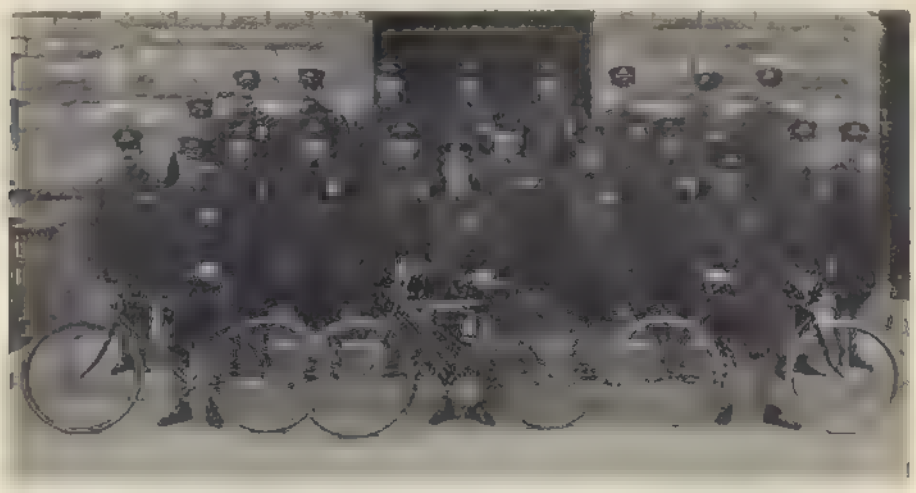
The men are not held responsible for their machines except where unwarranted negligence is proven to be the cause of an accident to the motorcycle and in the whole three and one-half years since the formation of the squad there has not been one such case.

SYSTEM SATISFACTORY

The Bureau of Police states that the motorcycle squad has long since passed the experimental stage and proved to be satisfactory in every respect. So much so, in fact, that the praises having spread to other cities, have resulted in inquiries from all quarters as to how the system is operated. Nothing more can be expected of it. The men adapt themselves to the machines at once and have no trouble with them whatever.

There are a few points, however, about the machines and equipment, which might be offered in the way of improvement. It has been mentioned as a suggestion that the machines be equipped with small fire extinguishers; also that some arrangements be made and provided for the carrying of small children in case of accident. Accidents to children on crowded thoroughfares are frequent and the victim's speedy removal to a hospital is sometimes the only chance of saving their lives. In the new models several changes have been made which some of the officers seem to think make the machine not quite as handy to repair, such as the new compensating sprocket which is made in such a way that when it is desired to replace a bolt it is necessary to remove the whole rear sprocket, also the new position of the spark plug in the head instead of the side makes it more likely to become clogged with oil.

Aside from the minor points just mentioned the machines are all giving perfect satisfaction and are upholding the reputation of the makers.



The cycle squad of 1905 just after its formation when it had only one motorcycle. Its first in police service in this city.

---

The police department of La Crosse, Wis., recently purchased a Harley-Davidson motorcycle. It will be given a thorough test, and if found satisfactory, more will be purchased.

Two more 3½ H. P. Indian motorcycles have been installed in the Police Department of Houston, Texas. This makes a total of four now in use and three more have been ordered.

The November issue of this Journal will be a special issue in that it will contain complete alphabetical list of exhibitors and show space diagrams of the Atlanta National Automobile Show.

# FOR SAFETY AND SERVICE

Eighty per cent of the high-grade cars made in America are equipped with Solar Lamps.

These cars are sold on quality. The makers could buy lamps at a less price than they pay for Solar quality, but they realize that there is only one lamp whose presence would not cheapen the car itself.

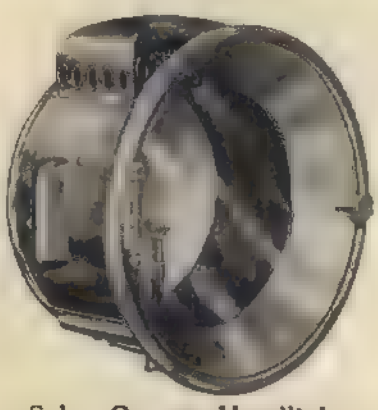
They know that the motorist who desires the utmost in quality, reliability and beauty must inevitably turn to Solar Lamps.

Solar Lamps contain fewer parts than any others. The main body of each headlight is one piece of heavy gauge drawn brass, and the parts are assembled by interior screws, producing a perfectly smooth exterior surface, easy to clean. All parts are interchangeable.

All headlights are equipped with the special short focus lead glass B. & L. Solar lens mirror, the finest and most efficient made.

Solar quality is maintained in the Solar side and tail lamps, the Solar generators, and the entire line.

Every Solar Lamp has a model number stamped on it. By quoting this any part desired can be immediately replaced from the factory.



**Solar Omega Headlight**

Model 1076—Price, $ 9.00
Model 1077 Price, $10.00
Model 1078—Price, $13.75
Model 1079—Price, $18.75

**Solar Senior Electric and Oil Tail Lamp**

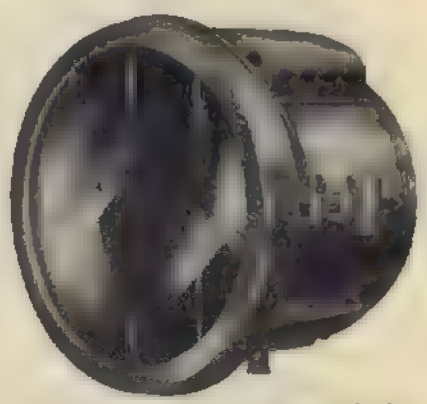
Model 905—Price, each, $3.50
Model 906—Price, each, $5.00

## Badger Brass Manufacturing Company

# IT MUST BE A SOLAR

Solar Electric and Oil Side Lamp

Model 1032C—Price, per pair, $12.00
Model 933C—Price, per pair, $15.00
Model 935C—Price, per pair, $20.00



Solar Lens Mirror Searchlight

Model 956A—Price, $ 7.50
Model 957A—Price, $ 9.00
Model 958A—Price, $12.00
Model 959A—Price, $17.50

Our aim is not to build a lamp as cheaply as we can, but to build as good a lamp as we know how, and sell it as cheaply as we can.

Every Solar Lamp, from the largest headlight to the smallest tail or side lamp, represents the very best materials and workmanship it is possible to use in that particular lamp.

We are the only concern in the country making a complete line of lamps and generators for all automobile, bicycle and mo or boat uses. No other plant, therefore, is anywhere near as well equipped to give satisfactory service along all lines.

Besides, our immense output enables us to reduce manufacturing and overhead expense to the minimum.

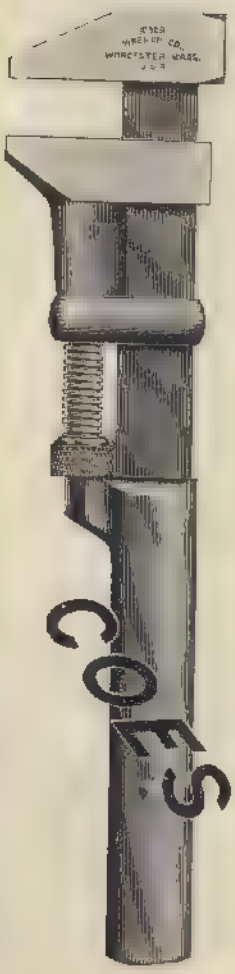
As a consequence, we are able to offer a far better lamp than is possible to competition ; and in many cases at even a less price than is charged for common lamps.

**Send for complete catalog.**

*N. B. - We have something special under way. It will be ready for the New York show. Watch for it.*

**Kenosha, Wisconsin New York City**

# The WORD "C"




## Look for this Star

91

## Trade Mark

# "COES"

## ON A

# WRENCH

## IS THE SAME AS "STERLING" ON SILVER

¶ It stamps the wrench a genuine Coes and protects you against unfair substitution. Our wrench book is brimful of lots of things you would like to know about wrenches. A request by mail will bring it to you.

**Coes Wrench Company,** WORCESTER MASSACHUSETTS

NEW YORK AGENTS

J C McCARTY & CO. 21 Murray St. N.Y. City J H GRAHAM & CO. 113 Chambers St. N.Y. City

THE wise automobilist is always guided by the Star trademark on a wrench package, for he knows it stands for wrench perfection, consequently freedom from the troubles which are sure to beset those who depend on inferior makes. Every **Genuine Coes Wrench** package and wrench is so marked. Be sure to look for the Star. None genuine without it.

# that guides the Wise Men

**Coes Wrenches** are the strongest and most durable made. It is for this reason that they outsell all other makes. For seventy years we have been engaged in their manufacture. In that time we have learned a good deal about wrenches, as you can imagine. You get the benefit—when you buy the **COES.**

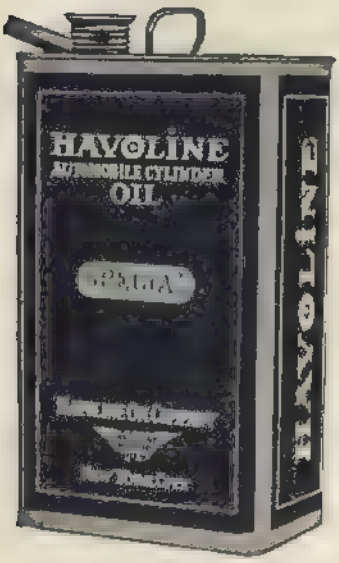
***May we Send you a Copy of Our Wrench Book?***

**Coes Wrench Co., Worcester, Mass.**

NEW YORK AGENTS: J. C. McCarty & Co., 21 Murray St., N. Y. City.
John H. Graham & Co., 113 Chambers St., N. Y. City.

# HAVO

## AUTOMOBILE LUBRI




¶ Everyone appreciates the value of good lubrication, and everyone who owns a motor car wishes to use the best lubricating oil.

¶ The reason so many inferior oils are used is because the subject is not understood. This is the situation—

¶ A cylinder oil is required to do two things: (1) lubricate and (2) burn up cleanly.

¶ Any oil will lubricate if it has enough body, but very few will burn up cleanly—they contain too much carbon.

## HAVOLINE OIL COMPANY

BOSTON HAVOLINE MOTOR OILS CHICAGO

# LINE
## MOTOR BOAT
# CANTS

¶ Carbon is removed from oil by filtration, and the more completely an oil has been filtered the cleaner it will burn.

¶ The best oil is simply the one which has enough body to lubricate and has been most completely filtered.

¶ We are the only concern in the world who manufacture completely filtered Pennsylvania Oils of sufficient body to properly lubricate a Gas Engine.

¶ Just compare a sample of Havoline Oil with any other brand of oil in existence—you will quickly see a difference.

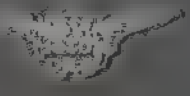
¶ *Write for 1909 catalogue and price list, sent postpaid upon request.*

**75 BROAD STREET, NEW YORK CITY**

ST. LOUIS — SAN FRANCISCO

USE
HAVOLINE
OIL
?

IT MAKES
A DIFFERENCE



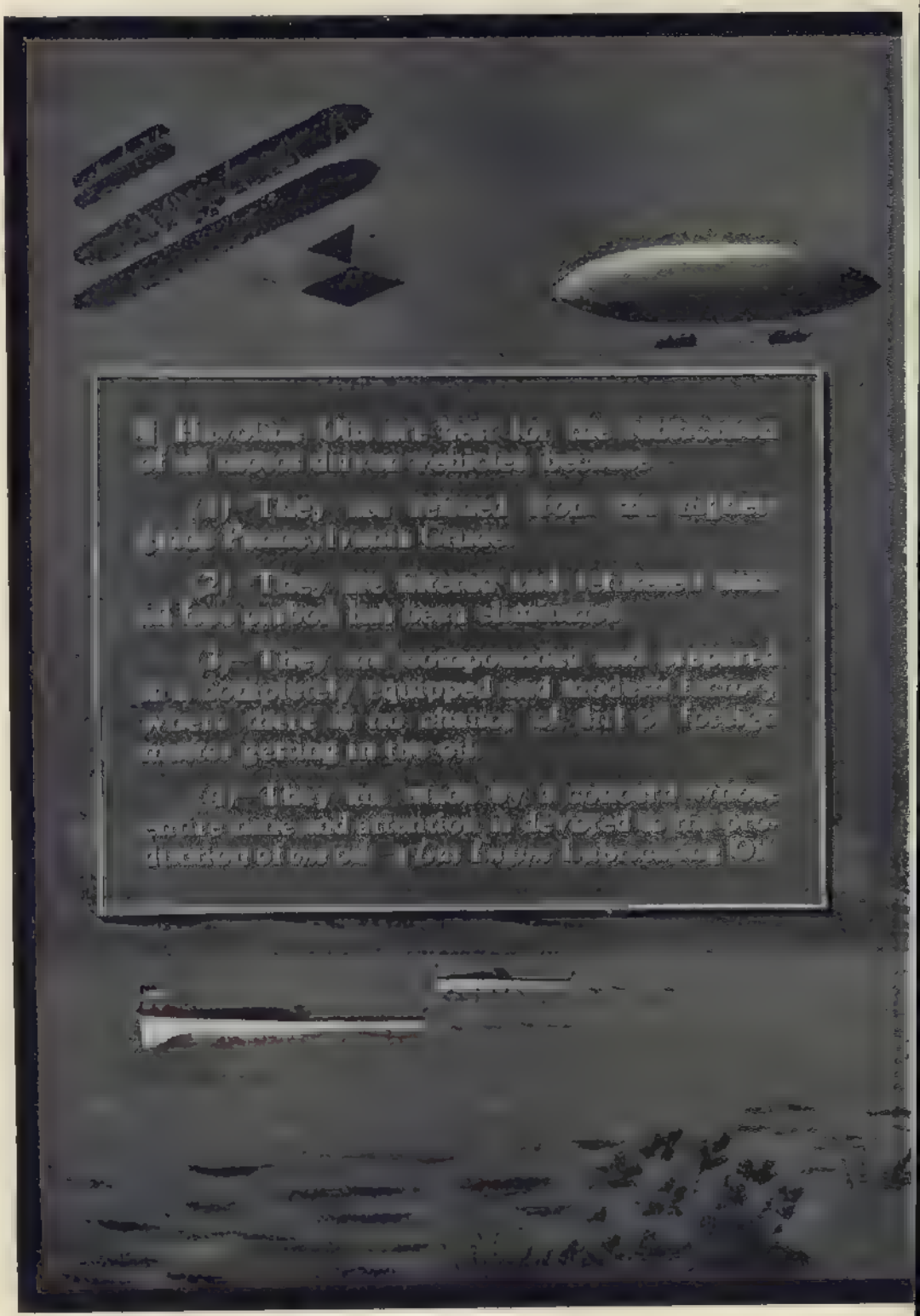
¶ An Automobile Cylinder Oil is required to do two things: (1) lubricate and (2) burn up cleanly.

¶ Any oil will lubricate (if it has a certain "body," but very few will burn up cleanly—they contain too much carbon.

¶ Havoline Oils are the only oils on the market which are completely filtered and which possess sufficient body to lubricate and yet burn up clean.

¶ In proof of this statement we simply ask you to LOOK AT THE OIL.

HAVOLINE OIL COMPANY
78 BROAD STREET, NEW YORK

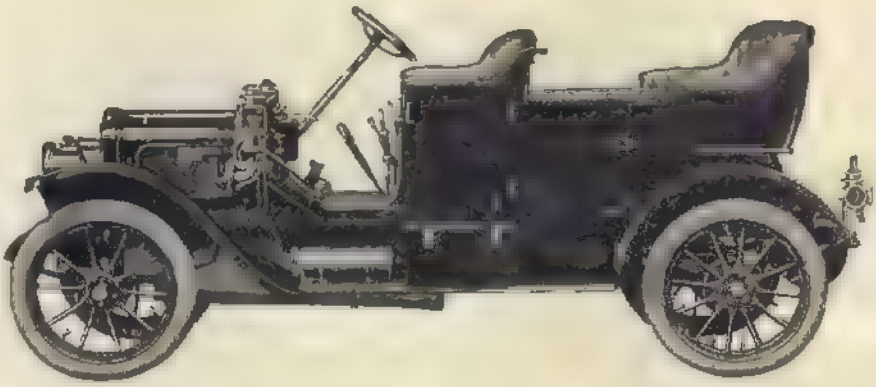


GASOLINE OIL COMPANY

HAVOLINE

PURIFICATION

# WHITE STEAM CARS
## FOR 1910



The White Steam Cars for 1910 will be made in two models—one of 40 horse-power, known as the Model "M-M," and selling at $4000, and the other of 20 horse-power, shown above, known as the Model "O O," and selling at $2000. The new cars will closely resemble the Model "M" and the Model "O," respectively, of the past season.

The most important feature of the new models is that either kerosene or gasoline may be used as fuel. The necessary adjustments to a car so that the fuel may be changed from gasoline to kerosene, or vice versa, may be made in a few minutes. So completely have we solved the kerosene problem, that when a car is in operation it is practically impossible for any one to tell whether kerosene or gasoline is being used. By using kerosene, the drivers of White Cars will enjoy the advantages of a very cheap fuel which can be handled with impunity and which can be procured at every cross-roads store and at almost every farm house.

The other new features comprise: a lengthening of the wheel-base of the 20 horse-power car to 110 inches, a pressed-steel frame and a further tilting of the steering post in the 40 horse power car, and a slight modification of the design of the engine in both models, whereby the water pumps are driven from an eccentric located outside of the crank-case at the rear of the engine.

**Write for Descriptive Circular**

# THE WHITE COMPANY

New York City, Broadway at 62d St.
Boston, 320 Newbury St.
Philadelphia, 629-33 N. Broad St.
Pittsburg, 133-143 Beatty St.

**860 East 79th St.**
**CLEVELAND**
**OHIO**

Cleveland, 407 Rockwell Ave.
Atlanta, 120-122 Marietta St.
Chicago, 240 Michigan Ave.
San Francisco, Market St. at Van Ness Ave.

"SHOW THE WAY"

## SOLAR HEADLIGHTS

Cover the FULL width of the highway. They do not limit the lighting area to a narrow ray in front of the car alone. They illuminate BOTH sides of the road—they enable the driver to SEE clearly and distinctly—they make night riding enjoyable and safe. Experience has enabled us to bring our lamps to a state of perfection not even attempted by any other manufacturer.

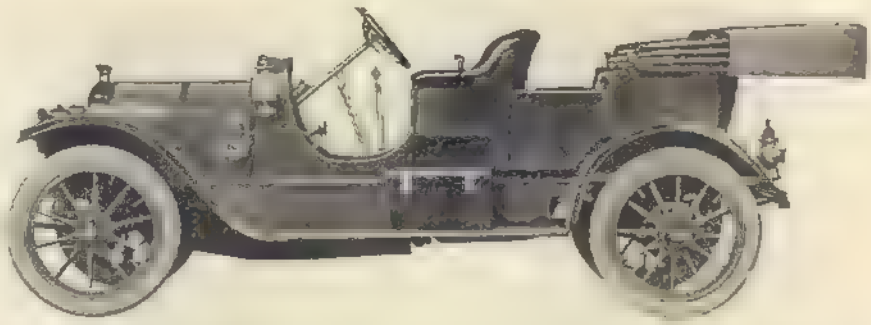
THE BADGER BRASS MFG. CO.

Two Factories:

Kenosha, Wis.

437 Eleventh Ave., New York

# WHITE GASOLINE CARS FOR 1910



With the addition of a gasoline car to the White products, our extensive selling organization is in a position to meet the demands for all classes of cars. With our unequaled factory facilities, long experience in automobile building and thoroughly trained organization, unencumbered by any preconceived notions for or against any particular construction, we are in a position to furnish the best in gasoline car design, workmanship and material.

The White gasoline car is fitted with a four-cylinder, four-cycle engine of extremely simple and neat design. The car has a four-speed selective type transmission with direct drive on the third gear. The four cylinders are cast in one piece. The cylinder dimensions are 3 3-4 inch bore and 5 1-8 inch stroke. The crank-shaft has but two main bearings, which are annular ball-bearings of generous dimensions.

Every detail of the car is in accordance with the most advanced foreign practice, and its many desirable features, not found on other American machines, ensure that it will be the popular medium-priced car of the year. It will be made in two types, differing in details of running gear and of body construction but with identical power plants. The prices of these two types will be $2000 and $2500, respectively.

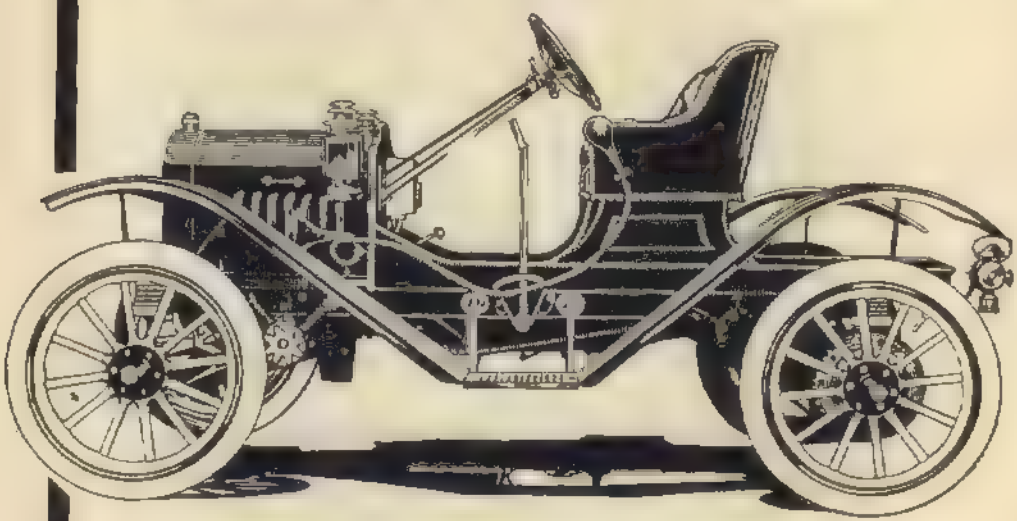
**Write for Descriptive Circular**

## THE WHITE COMPANY

**860 East 79th Street**

**CLEVELAND, OHIO**

# Everyman's



## Think of it---$485 for the best-built, most thoroughly proven, easiest riding, most economical, handiest small automobile in the world!

*The New Brush Runabout* not only outclasses all small cars, but is far ahead of its own previous high standard

Even though we have learned the lessons all manufacturers have to learn by experience—even though we have manufacturing facilities as nearly perfect as money and brains can make them—still we could not build a car of the quality of the 1910 Brush if we merely imitated the big cars with all their complicated parts and all parts necessarily smaller and weaker.

Here's where the genius of the designer counts.

The Brush has always been and still is the only real Runabout built in America.

The new 1910 Brush is not a designer's dream but the result of years of experience and a knowledge acquired by manufacturing 3,000 Brushes that are in daily use. It is a car which with one chassis adapts itself perfectly by change of bodies to a hundred different uses.

It is a car new in power, smoothness, speed and looks, but built on proven principles by an organization already perfected.

The Brush has the fewest possible parts, but they are of sufficient size and strength to stand the hardest knocks

*Simplicity* makes it possible to build the car right and still sell it at this wonderful price.

As for reliability, there is no comparison between the Brush and any of the small imitations of larger multi-cylinder cars.

With the new Brush you get single-cylinder simplicity, reliability, light weight, low gasoline and oil consumption, low tire expense with four-cylinder power and smoothness.

Its new balanced motor runs as quietly as a four-cylinder and is as flexible. Its power is astonishing.

The most wonderful improvement in Motor Car Construction in years.

While the balanced motor is the most remarkable feature of the 1910 Brush, we have made numerous other improvements and refinements.

Here are some of them: wheel-base lengthened 6 inches; more graceful and rakish lines; Mercedes type radiator; new selective control; universal coupling-shaft; improved dust-proof commutator; multiple disc low and reverse clutches; transmission control levers entirely housed and oil-tight; more quiet muffler.

In our magnificent new plant we make every part of the Brush except the wheels, tires and electric equipment. The Brush buyer pays no middleman's or parts-maker's profit.

# Car at Last

# 1910 BRUSH

# $485.00

## Read the Specifications

**Motor**—10 Horse Power, *balanced* single cylinder, four-cycle, vertical, 4" x 5", water-cooled; located in front under hood; every part instantly accessible; three point suspension

**Balancing**—After balancing by the usual counter-weights, one extra loaded balance gear, driven by a crankshaft gear, is applied, the result of which is to take out *all* of the vibration due to reciprocating weight and in addition *most* (or at times *all*) of the torque vibration—theoretically *is better balance than a four-cylinder motor.*

**Transmission**—Internal gear type, perfectly quiet; entirely enclosed and absolutely oil-tight.

**Cooling**—Mercedes type radiator, on Brisco thermo syphon system, eliminating pump

**Drive**—Double side chains to rear wheels.

**Control**—Single hand lever of selective action for all speeds spark and throttle under steering-wheel, foot-pedal releases clutch without touching the hand-lever, and also applies the brake. This clutch released by the foot is one of the fine features of the Brush and is found on no other low-priced car

**Steering Gear**—Another exceptional feature; internal reducing spur gear, slow and powerful at straight-ahead and accelerating as the wheel turns, entirely enclosed and oil-tight.

**Axles and Frames**—Oil-treated, selected wood, oak, hickory and maple; wonderful for strength, durability and lightness.

**Springs**—Spiral, located at extreme four corners absolutely the easiest riding springs on any car and mechanically impossible to break.

**Brakes**—Internal expanding in rear sprocket hubs.

**Wheels**—Artillery, with 28" x 3" pneumatic tires.

**Wheel Base**—80 inches.

**Tread**—56". For Southern trade 60".

**Equipment**—Tools, tire kit, 3 oil lamps, horn.

**Color**—Maroon, except coupe

**Body**—Divided seat; trimmed in high-grade leather. Platform on rear, as pictured on opposite page, with equipment, $485 00.

Six special bodies, furnished on order, at extra prices, as follows: rear platform with steel tool box; rear compartment with removable steel deck, single or double rumble with wooden tool box; racer type, coupe.

**Speed**—35 miles an hour, except racer type which has especial gearing.

*MAIL THE COUPON TO-DAY*

C. & A. 12

BRUSH RUNABOUT CO.,
1212 Baltimore Ave., Detroit, Mich.

Please send me a copy of the advance Brush Catalog.

Name....

Address....

City....

State..

## Brush Runabout Co.

1212 Baltimore Ave.

DETROIT, MICH.

# KOEHLER "40"

## AT $1650.00

represents the greatest value thus far presented in the automobile business, and we think we are justified in stating that no automobile introduced this season has created such a sensation. The **"Koehler 40"** is a car developed as the result of 12 years' experience in selling automobiles, and in design, material and workmanship it is equal to cars selling for $3000 and more. The type of body known as the "Montclair" is one of the most exclusive and luxurious styles introduced for 1910. High quality and low price are combined in the **"Koehler 40,"** and it is therefore a car for the man who wants the best and full value.

### DEALERS:—

We can give you the most complete and best selling line in the United States for 1910. It includes the

| | | |
|---|---|---|
| **HUPMOBILE** | **—4 cyl., 20 H. P., Runabout,** | **$ 750** |
| **RIDER-LEWIS** | **—4 cyl., 30 H. P., Touring Car,** | **$1050** |
| **RIDER-LEWIS** | **—6 cyl., 7-Passenger " "** | **$2500** |
| **KOEHLER "40"** | **—4 cyl., 5-Passenger " "** | **$1650** |

We are general distributors for these cars in the following territory

**Koehler "40"**—United States.

**Rider-Lewis** —New York, New Jersey, Pennsylvania, Delaware, Connecticut, Rhode Island, New Hampshire, Vermont, Massachusetts.

**Hupmobile** —New York, east of and including Rochester, North Eastern and Central Pennsylvania, Maine, New Hampshire, Vermont, Massachusetts and Connecticut.

Write us now for agency proposition.

## H. J. KOEHLER CO.

**1711 BROADWAY, N. Y. CITY**

# KOEHLER "40"

## $1650.00

¶ **The car of surprises** for wide awake dealers and motorists.

¶ **When, over a year ago,** we decided to market our own cars, we concluded that there was a large field for a high-powered, high-class car at a low price

¶ **Our twelve years' experience** as the largest wholesale and retail dealers in automobiles in America, enabled us to judge what was wanted by both dealers and owners.

¶ **In deciding upon the design and equipment** of the KOEHLER '40,' we visited practically every important factory in the United States and studied all the details of automobile design and manufacture. The result of our long experience and this investigation is shown in the car on which we now place our name and reputation.

¶ **The price, $1650,** is that usually charged for cars of smaller horse power. The quality is that found in high-priced automobiles. This means maximum power, speed and reliability at the minimum selling price.

¶ **Note the following specifications.** Can you match them for less than $2500?

## SPECIFICATIONS

**MOTOR** 4 cylinders, 4 cycle, 4¼ bore by 5 stroke, water cooled.

**IGNITION**—Magneto and battery.

**LUBRICATION** -Splash system with mechanical oil pump, gear driven Oil reservoir integral with crank case.

**VALVES** Mechanically operated from one cam shaft. Cams integral with shaft All points of contact in connection with valve movement, hardened.

**COOLING** -Radiator, and gear driven centritugal pump Ball bearing fan driven by 1" flat belt from crank shaft. Fan attached to engine. Adjustable.

**CONTROL** Spark and throttle levers on top of steering wheel. Segment stationary and independent of wheel. Foot accelerator works in conjunction with hand throttle.

**STEERING WHEEL**—19 inches.

**MUFFLER**—Scientifically designed, eliminating back pressure. Exhaust pipe diameter increases between first and fourth cylinders. Equipped with cut-out at front end, giving direct exhaust.

# THE H. J. KOEHLER CO.

## 1709 BROADWAY, N. Y. CITY

**Address Dept. M.**

# KOEHLER "40"

## $1650.00

## SPECIFICATIONS—Continued

**TRANSMISSION** Sliding gear, selective type, three speeds forward, one reverse. Operating lever in H quadrant, roller bearings.

**DRIVE** Shaft drive.

**CLUTCH** Cone type, composition face, with springs underneath to insure smoothness of engagement. Not affected by oil or water.

**REAR AXLE** Most improved type with extra large driving gears to insure wear Entire axle generously proportioned. Ball thrusts

**FRONT AXLE** Single piece, drop forged, special steel "I" beam section.

**FRAME** Pressed steel, channel section with sub-frame, narrowed in front to permit of short turns.

**WHEEL BASE**—112 inches.

**TREAD**—56 inches.

**WHEELS**—34" Artillery type, large spokes. Q. D. Rims.

**SPRINGS** Front spring, 48" semi-elliptic. Rear, 52" ¾ scroll elliptic.

**BRAKES** Two separate systems One over external, operated on pressed steel drum, the other, internal expanding. Adjustment accessible and alignment perfect.

**BODY** Five passenger. Color and design exclusively our own.

**GASOLINE CAPACITY**—20 gallons.

**EQUIPMENT**—Magneto, batteries, two large gas head-lights, two dash lamps, one rear lamp, generator, tube horn, robe rail, well-equipped roll tool kit, jack, tire pump, tire repair outfit, tool box attached to running board.

¶ **There is still a great surprise in store for you. THE CAR**- when you see it-- you will say is the swellest looking automobile it has been your good fortune to see Body is the most classy and rakish offered for 1910.

¶ **It is bound to be copied,** and we do not feel justified in publishing illustrations of it to be copied by manufacturers who may be late with their next season's models.

¶ **We will, however, give full details to interested dealers.**

¶ **The KOEHLER "40" is the best proposition in America to-day for the dealer.** Its value will attract trade, and it is a car easier to sell than to sell against

# THE H. J. KOEHLER CO.

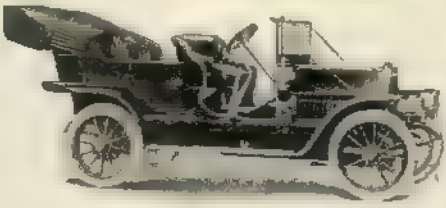
## 1709 BROADWAY, N. Y. CITY

**Address Dept. M.**

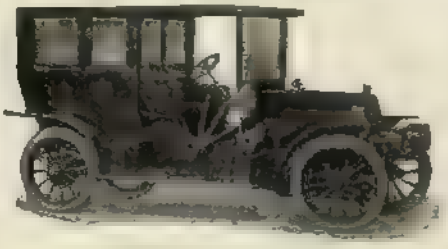
# THE JEWEL "40"

MODEL "K" ROADSTER

MODEL "M" CLOSE COUPLED BODY



MODEL "G" TOURING CAR



MODEL "H" LIMOUSINE

## FOUR MODELS

A car for every purpose, from the sturdy roadster to the luxurious limousine, and each priced consistently with mechanical perfection, beauty of design and elegance of finish.

The Jewel has been on the market long enough to place it beyond the experimental stage. Hence it is **an absolutely** safe purchase, either for the dealer or individual.

Each model has the Rutenber Motor, double ignition system Truffault-Hartford Shock absorbers,—in fact the equipment is of the highest grade throughout.

**Model G—7-passenger Touring Car - $3,000**

**Model H—7-passenger Limousine - 4,000**

**Model K—Roadster - 3,000**

**Model M—5-passenger Close Coupled Body, 3,000**

We want good representatives in territory not already covered.

## THE JEWEL MOTOR CAR COMPANY

**Factory and General Offices: MASSILLON, OHIO**

**BRANCHES**

**NEW YORK, 1662 Broadway** **CLEVELAND, 2174-80 E. 9th St., S. E.**
**Pittsburg, 5920 Baum St.**

**AGENCIES:**

Boston: L. F. Witherell, 216 Pleasant St.
Kansas City: The Rhodes Implement Co., 1308-10 W Eleventh St
Toledo: The Standard Garage, 233-5-7 Ontario St.
Oakland, Cal.: D. E. McCabe, Keystone Garage.
Chicago: The S. H. Peterson Automobile Co., 1229 Michigan Ave.

# 1910 Maxwell Model 62

The new four-cylinder, thirty H. P. models of the Maxwell line for 1910 follow in most particulars the construction of the same cars a year ago, although there are a number of important modifications and refinements which should interest the reader

The most obvious changes are a longer wheel base, larger wheels, roomier bodies and a marked improvement in riding qualities attained by the use of three-quarter elliptic springs

The frame is of pressed steel, hot riveted, and of channel section.

mission, which, as in former cars, is of the progressive sliding gear type, with three forward speeds and reverse. A noteworthy feature of all Maxwell cars is the provision of an interlocking device, consisting of a notched quadrant, which makes it absolutely impossible for the operator to shift gears while the clutch is in engagement. All gears are made of chrome nickel steel of ample proportions and accurately cut. The motor and transmission as usual in these cars are supported in the frame at three points.

The clutch is of the well known multi

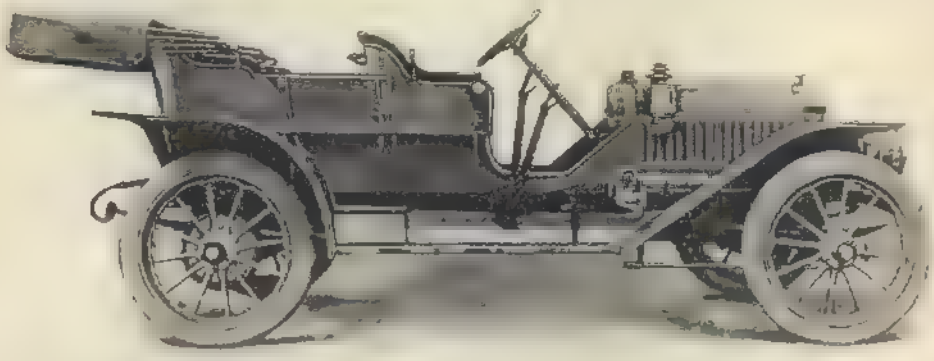


Fig. 1 The 1910 Maxwell Model 62 It is now sold for $1,500. has a 4-cylinder 30 H. P. motor, three point suspension of power plant, multiple disc clutch, locking device in the change speed gear, etc., as previously used in Maxwell cars. The tourneau is detachable, converting the car into a runabout

POWER PLANT

The power plant is of the four-cylinder vertical type, with cylinders cast separately, so that five large bearings can be used. Easy access to connecting rods main bearings, etc., is effected by large hand holes, four on each side. The valve chambers and water jackets are integral with cylinders. The water spaces are very large and extend not only around the piston chamber but also around the valve chambers. The valves themselves are of generous size, located on opposite sides and operated by cams and square push rods moving in bronze guides.

The crank case forms a unit with the transmission case, and is a special aluminum alloy casting, divided into four compartments which hold a quantity of oil for lubricating main bearings and connecting rod bearings by splash. The crank shaft is drop forged of nickel steel, finished all over, and treated by a special toughening process. The main bearings are of specially compressed babbit metal and provided with grooves to facilitate proper lubrication. The rods were especially designed to allow adjustment at both ends and have oil grooves to insure perfect lubrication.

No change has been made in the transple disc type, running in oil as in the other models. This arrangement reduces wear to an almost negligible quantity. The oil in the clutch apartment also performs the peculiar function of facilitating the action of the clutch in engagement, for while it lubricates the clutch with the plates sliding loosely upon one another the cohesive property of the thin film of oil that remains between the plates after the surplus has been squeezed out, causes the clutch plates to be locked firmly and to rotate together without slipping when the clutch is engaged. Yet the clutch can be made to slip to any desired degree, without heating, a welcome feature when, as it often happens in crowded traffic, it is desired to slow the car down for a moment without changing gears.

The drive to the wheels is by propeller shaft with two universal joints. The forward joint is packed in grease while the one at the rear end of the shafts is provided with a unique self-oiling device The engine is inclined so that a straight line may be drawn through the engine shaft and continued through the transmission and drive shafts through the differential. This straight line drive reduces wear in the universal joints to a minimum besides saving engine power.

Cooling is by the thermo-syphon system, of which the Maxwell was one of the earliest exponents. This method of engine cooling requires no pump. The cooling effect is proportionate to the requirements of the engine. The action of the honeycombed radiator is assisted by a belt-driven fan.

The carburetor is of Maxwell design, of the constant level, float feed type and provided with means for automatic compensation.

The problem of lubrication is most ingeniously solved by a special pump which forces the oil in exact quantities through a single sight feed into each cylinder. The lubricator is driven by a double set of gears and is positive in its action. The cylinder bears at its base a grooved ring, which is kept filled with oil at all times and into this the piston dips with each downward stroke. The piston itself is provided with two grooves.

Ignition is by magneto with non-vibrating coil, a battery of dry cells being added to facilitate easy starting. The coil is carried in a steel cylinder under the floor boards so that the dash is unencumbered with accessories and shows only the two-way switch, a single sight feed and glass gauge indicating the level of the lubricant in the tank, which latter also is carried under the hood.

Gas control is double, by pedal and by lever located at the left immediately under the steering wheel. Spark control is by a similar lever under the wheel, located on the right side.

The steering wheel is large and the steering itself is accomplished by worm and sector

The rear axle is of substantial construction and equipped with four roller bearings, two on either side of the differential and two near the hubs. The drive pinion also is equipped with two improved roller bearings. Two sets of brakes of the external contracting and internal expanding type are mounted on the rear hubs.

The wheel base has been lengthened to 110 inches, which is well within reasonable limits, long enough for comfortable riding, at the same time short enough to permit of easy handling in street traffic. The wheels are of artillery pattern of selected second-growth hickory; their diameter is 34 inches and the rims are of the quick-detachable pattern, with four-inch tires in front and rear.

All Maxwell bodies are made of sheet steel with stamped mouldings, a construction as light as wood and stronger than aluminum, not liable to breakage, since dents may be hammered out while in the case of the broken wood body the substitution of an entire new panel becomes necessary.

The thirty H. P. Maxwell chassis is furnished with three styles of body: the Model "E" five-passenger touring car, at $1,500; the Model "G" roadster, at $1,500; and the Model "G2" touring car with detachable tonneau. An extra charge of $75 is made for the detachable tonneau. The equipment includes gas lamps and generator, oil side lights, tail lamp, horn, tools and tire kit.

# The 1910 Duryea Buggyaut

The Buggyaut is claimed to be an all-the-year-around vehicle and does not have yearly changes of models. Its maker, Chas. E. Duryea, of Reading, Pa., has long been an advocate of sticking to a chosen model year after year; and his present design, being air cooled, is a good winter seller and so does not offer a slack period Improvements are made whenever experience shows the need thereof or ability permits. An advocate and user of mechanical means for generating the electric current since 1896, he now offers the option of a magneto as the source of current at $60 above the usual price. It is claimed that most users find the Buggyaut engine cools perfectly without a fan, but to those who insist on having one whether needed or not he now offers a lighter higher speeded four bladed fan instead of the many bladed one supplied in 1909. This fan has a cast aluminum hub and pulley carrying the ball bearings and is a very light and neat device. The cooling spines have been lengthened on the cylinder heads with consequent greater cooling surface and the great rapidity with which the copper spines carry out the heat permits using longer spines than is possible with cast iron or steel. The side bars of the chassis have been spread farther apart at their rear ends with much increased room for the cross springs and of course easier mounting of the carriage body. This placing carries the load farther from the center of the rear axles and so in effect stiffens this; the closer the load is carried to the wheels the less strength the axle need have at the center.

BODIES LENGTHENED.

The single seated bodies have been slightly lengthened to give more leg room, although holding to the neat light buggy effect, and the seats have been widened slightly. The storm fronts now roll up and fasten to the top where they are always in place ready for use instead of having to be removed as heretofore.

The wearing portions of the driving rings have proven themselves quite long

lived and it is claimed even to the surprise of the maker have not required even annual renewal thus far. They are made of a special tough steel and having ample surface resist the driving pressure and the slight friction quite successfully. That they may be quickly renewed, however, the later ones are not even pinned in place but are forced so tightly into grooves in the supporting ring that when worn down to their limit they can be loosened with a hack saw and new ones sprung in without other tools or machine work; thus making a most cheap replacement of the wearing surfaces.

The valves into the crank case have been slightly enlarged with some gain in speed and maximum power to the engine The vaporizing surface available in the tubes from the carburetor to the engine has been considerably increased in area with better ability to properly use the low grade gasolines now on the market and with some gain in economy. It is often said that it is impossible to feed mixture alike to all cylinders of a two-cycle engine because the vacuum and compression in the crank cases varies the mixture due to possible leaks or variations in volume but in the Buggyaut engine there is now provided means for easily enriching either cylinder's supply of mixture thus compensating for any variations. This permits both cylinders to be fed the proper mixture

The Duryea Buggyaut which is shown herewith is fitted with folding seat, open and double top. This makes a very light and simple family carriage able to carry four people comfortably. The rear part of the top is quickly removable and then the rear seat can be folded leaving a neat single seated buggy for the daily use of a doctor or other business man. The forward top is fitted to a shifting rail and is therefore easily removed also if desired.

The permanent seat is set nearly in the middle of the wheel base and gives the most comfortable position for the riders. The rear seat overhangs the rear axle very slightly but being mounted on very easy springs is not uncomfortable. The mechanism is wholly at the rear, so that the riders get no odor or heat from it and the weight being on the rear wheels insures freedom from slipping of the tires, with consequent reduction of tire expense

The "Duryea" Buggyaut.

Mudguards are furnished if ordered but the narrow tires throw very little mud. The mechanism is so simple that there is little need for accessibility, but the spark plugs can be reached from either side. The grease cups and timer are in plain sight from the rear and if desired the floor can be lifted exposing the whole top of the motor. There is no mechanism in front which leaves the front box available for parcels and renders the front wheels easy to push through mud or sand, a decided advantage in bad road localities.

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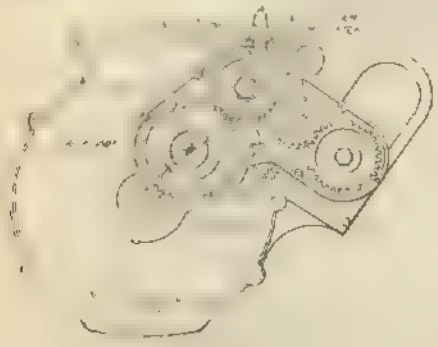
It has been decided to hold the Fourth Annual Kansas City (Mo.) Automobile Show from February 26th to March 5th, 1910.

gears, as well as the cam shaft gears are enclosed in aluminum cases and packed in grease. By removing the screws in the covers both trains of gears can be gotten at.

The roller bearings are exceptionally large, and consist of 12 rollers to each bearing. The crank pin bearing is of exactly the same construction except in size. It is slightly smaller in diameter, and 11 instead of 12 rollers are used.



Gear Trains and Oil Pump arrangement of the 4 H. P. M M Motor

The oil is confined in the bearing and from the outside of the crank case in a most simple and ingenious manner. An oil ring as it is called, having a deeply concaved inner surface, is placed just outside the bearing proper. An oil duct leads the surplus oil from the lowest point in this ring back into the engine base.

Aluminum mud guards are used on the new models. They afford greater elasticity to withstand road vibration, and save just a trifle over three pounds in weight. Many other detailed improvements are shown. In the 4 H. P. Magneto Single the gasoline tank has a one-quart compartment at the rear end with a separate valve. This is for use as an emergency tank.

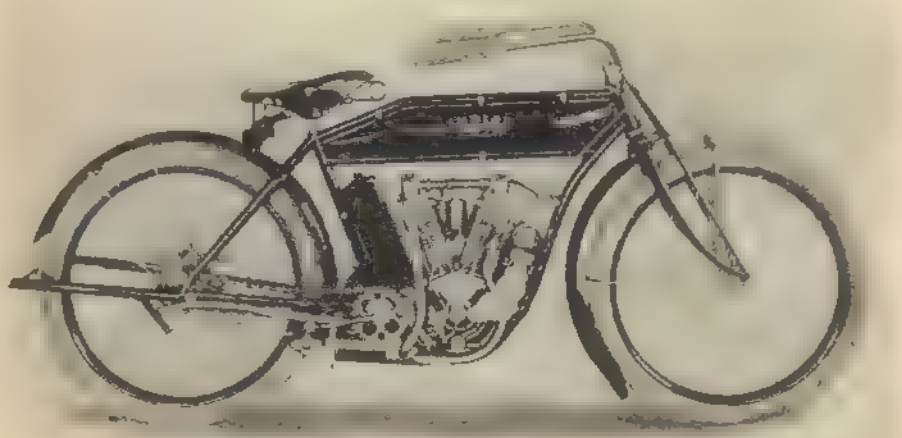
The three models can be had in either flat of V-belt drive and are listed as follows: 3½ H. P. Battery Special, $200.00; 4 H. P. Magneto Single, $225.00; 7 H. P. Magneto Twin, $300.00.

FREE ENGINE CLUTCH

As an extra the American Motor Co. will furnish a "free engine" clutch at an additional cost of fifteen dollars. The clutch is contained in the engine pulley, and is made for either flat or V belt drive. It consists simply of an expanding steel band that turns integral with the engine shaft, and a freely movable outer shell that provides the pulley surfaces. By means of a single vertical rod with a handle lever at its upper end, and a short lever at the bottom, an in and out motion is made to expand or contract this steel band so that the engine drives the rear wheel or runs "free" of the driving pulley.

# The 1910 Indians

For the coming season the Hendee Mfg. Co., of Springfield, Mass., is marketing four models; 2 single cylinders and two twins. The most notable change that is found in the 1910 Indian is the new fork construction, a detailed view of which is given herewith. The new fork is of the cradle spring type and is made without joints, of very heavy construction and thoroughly reinforced. A pair of strong braces extend from the lower extremity of the fork to the upper part of the steer-



The 1910 twin-cylinder, 5 H. P. Indian, magneto ignition

ing head, and are stayed out at the crown, thus forming a strong truss construction The wheel hub is mounted on a bell crank lever, one extremity of which is connected to the fork ends, while the other arm of the lever is pivoted to a

Detail view of the 1910 Indian front fork

pair of rods, which extend upward and connect with the spring. The spring is made of highly tempered vanadium steel embodying great strength. The bell crank which carries the wheel, is swung to the rear thus resulting in a remarkably smooth motion in the direction in which the road shocks act, thus avoiding any tendency toward twisting of the wheels. Provisions are made for properly lubricating the joints in the bearings.

Another new feature in the 1910 machine is an automatic oiler of the force feed type. This device sends an accurately adjusted stream of oil into the interior of the motor, thus insuring a continuous and ample supply of fresh oil which does not depend upon the judgment or memory of the rider. A hand pump is also provided as heretofore, but merely as a matter of convenience for adding an additional quantity of oil under special circumstances or for refilling the crank case after the spent oil has been drawn off.

A stand has also been fitted to the 1910 models, which although not new in principle, has been fitted in an improved manner. This stand is formed of strong but light "D" section tubing, with forged steel brackets and cross connected at the bottom, making it strong and stiff but very light. The stand is pivoted to the rear fork just in front of the rear axle, and when the machine is set up on the stand the bracket takes a bearing on a substantial stud brazed to the rear fork, thus giving a very solid support. The attachment on this stand, being entirely separate from, and in front of the rear axle, the rear wheel can be removed entirely from the frame, which is so placed as to be entirely clear of all of the rear wheel adjustments

Magneto ignition is the standard for the 1910 models, it having been found by experience, that this system has proven the most efficient and is practically absolutely free from trouble or necessity of attention. The 1910 machines will also be provided with a free engine and two speed gear if desired. In this device the clutch is a real clutch with positive action, giving a perfect free engine, while all of the parts are of ample proportions and strength to insure reliability and durability.

The first of the single cylinders is the regular 2¾ H. P. machine similar to that heretofore built, but including the improvements described in foregoing paragraphs The other single cylinder is practically a new model of 4 H. P. The new machine has a cylinder of 3¼ inch bore x 3 43-64th inch stroke, giving it a piston displacement of 30.46 cubic inches. The smaller of the twins is the same as last year's twin, namely the 5 H. P. The other twin is the 7 H. P. of 60 92 cubic inches piston displacement.

The prices of the 1910 Indians are as follows: 2¾ H. P., single cylinder, magneto ignition, $225, 4 H. P., single cylinder, magneto ignition, $250, 5 H. P. twin cylinder, magneto ignition (only), $275, 7 H. P. twin cylinder, magneto ignition (only), $325 The two singles are also furnished with battery ignition if desired at $25 less price charged for magneto ignition

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**The University of Pennsylvania Motorcycle Club** recently held its first meeting William Deshler Warner was elected president; H. D. Hueber, vice president, and E. R. Wilson secretary-treasurer. The new club is planning for a southern trip to Baltimore, Washington and Richmond, to be conducted Easter week.

**C. W. Kennard**, of Mechanicsville, Md., a non-resident member of the Baltimore Club, recently returned from a 2,030 mile tour on his twin Indian. On his trip Kennard averaged nearly 150 miles a day, passing through Washington, Baltimore, Philadelphia, Jersey City, New York, Albany, Syracuse, Auburn, Rochester, Batavia, Buffalo, Niagara Falls, Cleveland, Toledo, Garrett, Ind., Youngstown, Pittsburg, Bedford Springs, Harrisburg, York and Baltimore.

## First 1910 Announcement

# Pierce Motorcycles

TWO SPEEDS IN THE FOUR

LONG STROKE IN THE SINGLE

## FOUR CYLINDER

Our Four Cylinder Motorcycle for 1910 is considerably in advance of the 1909 Model. The most notable improvement is the addition of the two-speed and free engine contrivances. Sliding gear transmission with shaft and gears is used. More horsepower and even greater simplicity than in last season's Model. Improved oiling system and several minor changes.

## SINGLE CYLINDER

After much experimenting we are offering to the trade for 1910 the first Pierce Single Cylinder Motorcycle. It is as carefully constructed as the Four Cylinder, but on account of the simpler motor and transmission we are able to offer it at a price that will compete with all other Single Cylinder Motorcycles. Pierce design and quality throughout. More than usual horsepower. Remarkable for smooth and efficient running.

## The Pierce Agency for 1910

Is an asset well worth having. If you are a dealer, regularly in business, we invite correspondence on our proposition: "The Agency that Pays."

### 1910 Advance Catalogue Now Ready

Sent to anyone on request.

## The Pierce Cycle Company :: Buffalo, N. Y.

PACIFIC COAST BRANCH—Oakland, Cal.

drum have been increased, giving twice the area of the braking surface than that of the old model.

The brake band expands against the rotation of the hub. This is a radical departure from the old model. Opening against rather than with the direction of rotation makes it absolutely impossible for the brake to wind up, bind or lock. The brake responds instantly to the will of the rider who can gently retard the speed of his machine or come to an absolute halt by stalling his engine. These are the extreme possibilities. All degrees of braking results between can be attained by the application of proportionate back pedalling force.

In the new model also the old trouble of "picking up" the pedals has been eliminated, thereby avoiding the necessity of constantly changing position of the feet when riding.

The size of the brake has been increased, but not sufficiently to make the weight or size objectionable.

### NEW VEEDER MOTORCYCLE CYCLOMETER

Realization of the fact that small attachments on motorcycles are subjected to hard usage, has led the Veeder Mfg. Co., of Hartford, Conn., to bring a trip cyclometer designed specially for motorcycle use.

The case is larger, the gearing is heavier and it is fitted with a larger star-wheel than regularly used on a bicycle cyclometer, and the large motorcycle striker with adjustable bracket makes it a very durable instrument. The adjustable bracket can, by simply loosening one nut, be made to fit any make of machine. The mile figures are in white, with black background, the tenths of a mile in red, with black background.

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Three motorcycles are in use by the Police Department of Milwaukee, Wis., and the Chief of Police is making strenuous efforts to have the number increased to a dozen.

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# 1910 "Yale" Motorcycles

For the coming season the Consolidated Mfg. Co., of Toledo, Ohio, maker of the Yale motor cycle is offering three models, one twin, one single flat belt and one single V-belt. The magneto ignition is the only ignition system used on the twin and is optional on the single

patterns. An oil sight glass is fitted in the right hand side of the crank case. The exhaust and vibrator gear has a wide face, carefully hardened.

The twin cylinder motor has a piston displacement of 58 cubic inches. The cylinders are set at an angle

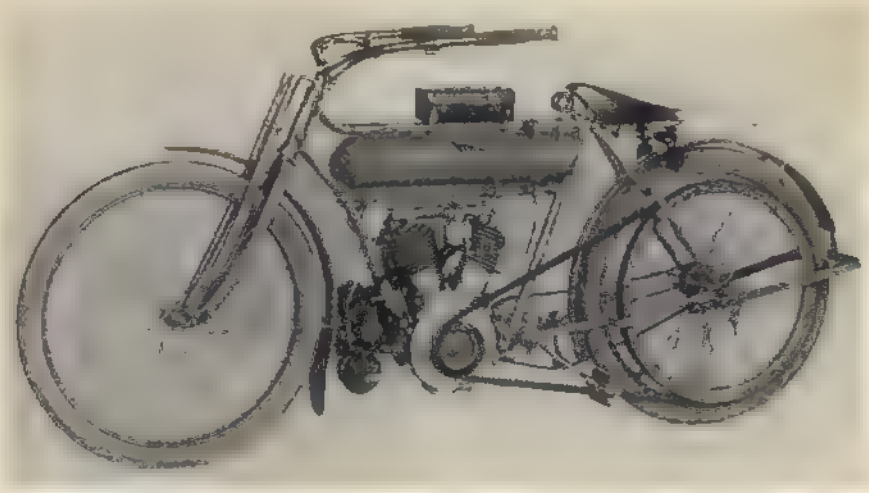
The Yale Single Cylinder 3½ H. P. Motorcycle 1910. Side view showing the same equipped with tandem [illegible] ignition or magneto at $35 extra; flat or V-belt; price, battery ignition, $200. Tandem attachment $2 extra.

The Yale 3½ H. P. single cylinder motor has a piston displacement of 30.21 cu. ins. The fly wheels weigh 31 pounds. The crank case is of aluminum. All bearings are forged from tool steel, hardened and ground and run in best bronze bearing metal. The valves are forged from nickel steel and the connecting rods are I beam forgings. Three piston rings are fitted of the eccentric type. The cylinder, piston and ring are cast from metal

of 45 degrees. One gear turned from solid bar, operates both exhaust valves and magneto. All the other specifications are similar to the single cylinder motor. The timer is simple and of compact form and is attached to the side of the gear case on main bearing. The contact points are iridium platinum and can be easily cleaned. The ignition is by jump spark from dry cells on the single cylinder machine. A Merz magneto is fitted at $35 extra.

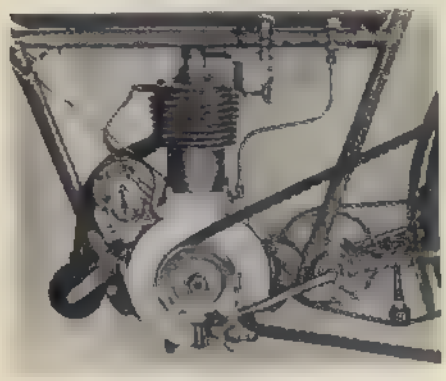
The twin cylinder machine is furnished with Bosch magneto as regular equipment. The Breeze float feed carburetor is regularly furnished. Control is by means of double grip from the handle bar.

brace. The connections are made from drop forgings and every joint is strongly reinforced. The rear forks are forgings and the head fittings are turned, carefully hardened.



The Yale Twin Cylinder Motorcycle Motor 6½ H P Cylinders set at 45 degree angle. Magneto Ignition. Belt transmission; price $300

Particular attention is called to the design of the muffler, which is small and compact, and is claimed to be very efficient and to entirely eliminate back pressure The battery box is located under the saddle and carries three No. 6 dry cells. It is



Right side view of the Single Cylinder Engine used on the Yale Motorcycle

easy of access and entirely waterproof. The transmission is by 1¾, specially tanned, waterproof two-ply, endless belt. Proper tension is maintained by an idler operated from the seat. An idler is also fitted to the starting chain which allows adjustment to correspond with the belt. A V-belt is furnished as an option. The ignition coil is attached to the seat mast with switch plug in head. The frame is of special design affording low saddle position and center of gravity. Sixteen gauge, seamless tubing is used with an extra

The wheel base is 54½ inches, and the front wheels are fitted with 36 spokes and the rear wheels with 40 spokes. The gasoline capacity is 1½ gallons, carried in a tank set between top and truss bar in the frame. The lubricating oil is contained in a separate compartment in the gasoline tank and is forced into the crank case by a pump which is within easy reach of

Detail view of the Luggage Carrier and Stand attached to the Yale Motorcycle

the rider. The handle bars are long and are attached to the fork stem in a manner which makes turning impossible. Three-inch mud guards are fitted. Tires are 28x 2½-inch clincher Morgan & Wright, or G & J. The Eclipse coaster brake is fitted and the front axle is of the knock-out type. The weight of the single cylinder

machine is 160 pounds, and that of the twin cylinder 190 pounds. The ratio of the single cylinder machine is 5¼ to 1 and that of the twin cylinder 4½ to 1. A luggage stand is attached to the rear fork ends and at an extra cost of $4. The price of the tandem attachment is $20.

The single cylinder machine lists at $200, with battery ignition and $235 with magneto, and the twin cylinder at $300.

# Answers to Motor Cycle Questions

(We desire not only our readers to make full use of this department, but any one who disagrees with the opinions herein expressed.)

## AIR COOLED TWO-CYCLE MOTOR CYCLE ENGINE

[461.] Will you kindly give me your opinion as to whether or not I shall be able to successfully air cool a small 2¼ in. x 2½ in. three-cylinder two cycle motor. This motor is to be used on a tandem motorcycle.

I propose to cast the cylinders with walls 1½ in. thick and turn the cooling flanges on in a lathe afterwards giving them a coat of copper 1-32 in. thick, copper applied by the electric plating process, when finished they will measure 3-16 in. x 1¼ in. with ¼ in. spaces between them.

Do you think this copper would peel off? At the top are pieces of ¼ in. copper tubing screwed into the cylinder head.

Inlet and exhaust manifolds are cast separate from cylinder and machined to a tight fit and attached with screws, ports to be drilled and machined after cylinder is finished.

GLENS FALLS, N. Y. J. F. REYNOLDS.

I should say that you do not need cylinder walls more than 3-16 thick at most, and that it would be better for the cylinder cooling, ribs to be thinner at the outer edge than at the root, and that the depth of rib should not be more than ⅓ in., or ⅝ at the most. The applied copper tube spines are difficult to place and fix, and probably would not suit you. The cooling projections, circumferential ribs or lengthwise ribs, or cooling spines should always be integral with the cylinder walls because heat does not pass a joining of parts readily.

Why not make a single cylinder and try various kinds of cooling projections, so as to know what you are doing before you build a 3 cylinder motor?

Or, if you do not want to find out for yourself, why not copy the work of others?

You do not need a coat of copper 1-32 thick to avoid rusting of cylinder cooling ribs. A very light coating of copper is enough; the thickness of tissue paper, say 1-1000 of an inch, is plenty for copper coating cylinders to prevent rusting.

It is easy to waste a good deal of time building little gas engines to meet your own ideas. Look at other men's motors, and copy prevailing practice. There are surely plenty of motorcycle cylinders to look at, almost all 4-cycle, but 2-cycle cylinders cool more readily than 4-cycle cylinders, although with the 2-cycle there are twice the 4-cycle burning charges, because the 2 cycle retains the burning charge so much less time.—H. D.

## HEADS SEPARATE OR INTEGRAL

[476.] I would like to ask a few questions on motorcycles. Will you please inform me which style of mechanical intake is the best, one in a separate chamber, or both intake and exhaust in one chamber? And would you tell me which style of cylinder gives the best satisfaction, head separate or cylinder and head cast in one piece?

FT LUPTON, COLO. CHARLES NELSON

There is very little choice between the two types of mechanical intake valves you mention. In some of the highest class engines the mechanical inlet valve is located in the same chamber and on the same side of the engine as the exhaust valve. In others, it is located on the opposite side of the cylinders. As far as the efficiency of the engine is concerned it makes little difference whether the cylinder is cast in one piece or whether the head and the cylinder itself are cast in two pieces and later bolted together. The latter construction has the advantage that it is only necessary to remove the head in order to examine the piston and remove the carbon from its surface and from the surface of the combustion head itself.

TECH. COMM.

## COMMUNICATION—FRONT FORKS TOO WEAK

Motorcycle manufacturers should take very good care in the making of the front forks, as when they break, as happened here recently, it is liable to do up the rider. The break took place on a common dirt road, and going not over 15 miles per hour. The rider was badly cut up, but what would the result have been at 30 miles, and on a hard state road? There is no excuse for making the forks light and defective; better add 4 or 5 pounds more metal and have it safe.

W. A. SIEGRAHN.

We heartily agree with the writer of this communication, and also favor making the forks in such a way that the wheel cannot possibly drop out. This matter was discussed in our August issue, page 185.

# Announcement of White Cars for 1910

The 1910 models to be made by The White Company, Cleveland, Ohio, comprise a 20 horse power steam car selling at $2,000; a 40 horse power steam car selling at $4,000; and a 20 horse power gasoline car which will be made in two types, differing in details of running gear and body construction, but with identical power plants. These two types will sell at $2,000 and $2,500 respectively. All of the above prices are f. o. b. Cleveland and are for cars with touring, toy tonneau, or runabout bodies.

The most important new feature in the 1910 White Steamers will be, as already announced, the modifications whereby high-pressure valve and the low-pressure valve are piston valves and are driven direct from the connecting rods, by what is known as the Joy valve mechanism. The two main bearings and the two connecting rod bearings are fitted with ball bearings of unusually large size.

A change has been made in the method of driving the two pumps which supply water to the generator. Instead of being driven from the valve gearing, as in the 1909 engine, they are driven from an eccentric. This eccentric is located outside of the crank-case, at the rear of the engine, and is forged integrally with that part of the universal joint which is at-

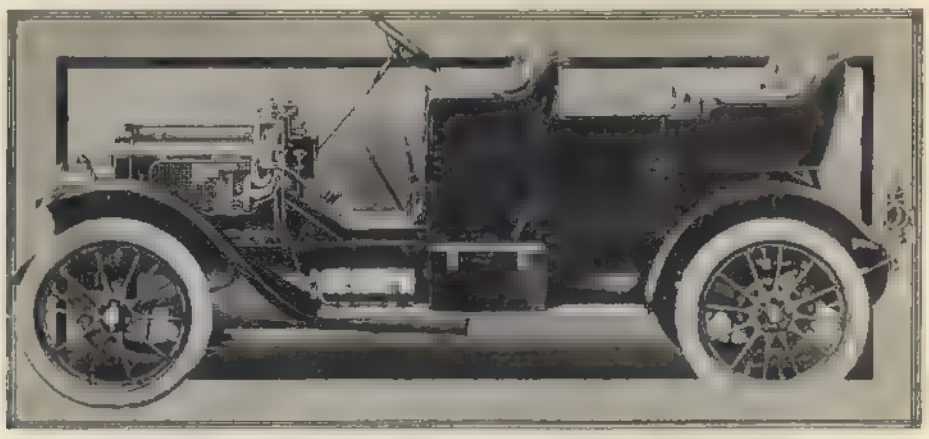


Fig. 1. 1910 White Car fitted with kerosene burner. The frame has been lengthened and the power plant placed further to the rear so that the condenser is directly over the front axle. These cars are made in two models known as Model "O-O" 20 H. P. and Model "M M" 40 H. P. Practically no changes have been made in the generator or regulator system. These models sell for $2000 and $4000 respectively.

either kerosene or gasoline may be used as fuel. Plans have been made for building a greater number of steam cars than have been made in any previous year.

### THE 20 HORSE POWER WHITE STEAM CAR

Considering, first of all, the 20 horse power steam car,—this will be known as the Model "O-O" and will be the successor of the Model "O" of the present season. The most noticeable change in the external appearance of the new model is a lengthening of the wheel base to 110 inches. The frame has been lengthened and the power plant moved back so that the front axle is immediately under the condenser. The shape of the mud guards has been somewhat changed, as will be seen in Fig. 1. The engine is compound, vertical and of the same compact construction as in the 1909 model, with a high pressure cylinder of 2½ inch bore, a low pressure cylinder of 4¼ inch bore, and a stroke of 3 inches. The crank shaft is a short, one-piece forging of tool steel with but two main bearings. Both the tached to the crank shaft, as clearly shown in Fig. 2. As in the 1909 engine, the pump which returns water from the condenser to the tank and the air-pump which supplies pressure for the fuel tank and for inflating tires, are driven directly from the valve mechanism.

The frame of the Model "O-O" is of pressed steel; the tires, both front and rear, are 32x3½; the front axle is of I-beam section and all the bearings in the car are annular ball bearings.

### THE 40-HORSE POWER WHITE STEAM CAR

The 1910 40 horse-power White Steamer will be known as the Model "M M," to indicate its close relationship to the Model "M" of the past season. The steering post is tilted considerably more than in the previous model and the shape of the mud guards has been changed. The wheel base remains unaltered at 122 inches. The frame is of steel, replacing the armored-wood construction formerly used. The "M-M" engine has all the characteristics of the Model "O-O" engine, described

briefly above, including the feature of driving the water pumps by means of an eccentric located outside of the crankcase. The dimensions of the Model "M-M" engine are: high-pressure cylinder, 3-inch bore; low-pressure cylinder, 5-inch bore and stroke 4½ inches.

The Model "M-M" is equipped with 36 x 4 tires on the front wheels and 36 x 5 tires on the rear wheels.

FEATURES OF BOTH STEAM MODELS

In order to use kerosene as fuel, no change has been made in the burner proper. The only modifications are in the

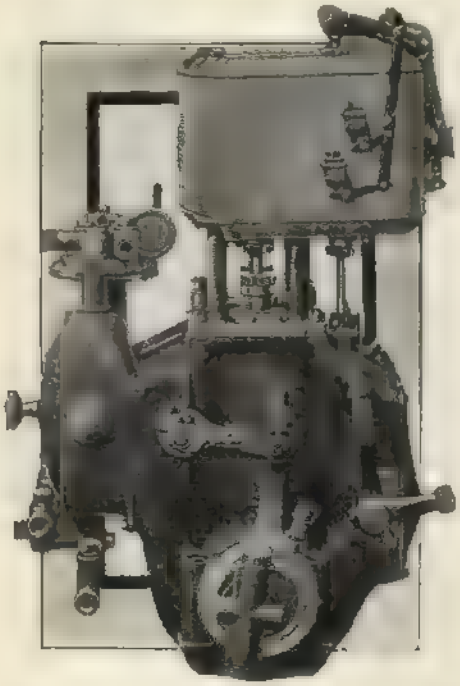


Fig. 2. View of the rear of the White compound engine used in the 1910 models. In the 30 H. P. car the high pressure cylinder is 3½ inches, low pressure, 4½ inches, stroke 3 inches. In the 40 H. P. car, high pressure 3 inch bore, low pressure 5 inch, stroke 4½.

vaporizer and in the shutter controlling the amount of air admitted to the burner. This new kerosene burner has a new and novel atomizer which though extremely simple is said to produce results that are remarkable.

Instead of a solid stream of vapor passing into the generator, as is the case with gasoline, the kerosene vapor is thrown in the form of a hollow or tubular stream, thus exposing an exceedingly large surface of vapor to the action of the air which is drawn into the generator. It is thus claimed that the mileage is increased about 20 per cent. over gasoline.

An improved draught in the 1910 steamers is obtained by what is termed "down draught," which the maker claims, entirely eliminates interference with the generator by heavy wind. As for the degree of success obtained by the designers of the White in adapting the car for the use of kerosene, it is only necessary to say that, when the car is in operation, it is practically impossible for any one to tell whether kerosene or gasoline is being used as fuel. When starting the car "cold," it takes about five minutes longer to heat the vaporizer sufficiently so that the main fuel supply may be turned on but, thereafter, the action and operation of the car are the same as when gasoline is used as fuel. Only a few minutes are required to make the necessary adjustments to the vaporizer and to the shutter so that the fuel may be changed from kerosene to gasoline, or vice versa

The generator in both the Model "M M" and Model "O-O" is of the usual White construction, consisting simply of nine coils of steel tubing so joined together that, in operation, water is supplied to the upper coil and steam issues from the lower coil. No change has been made in the regulating system, as this part of the car may be said to have been developed to a state of perfection; that is, the temperature and pressure of the steam remain practically constant without in any way engaging or requiring the attention of the driver, no matter what the running conditions may be

THE WHITE GASOLINE CAR

In adding a gasoline car to their line at this time, the White Company, with their large factory facilities, long experience in automobile building, unencumbered by any preconceived notions for or against any particular construction, are in a position to furnish the best in gasoline car design.

The White gasoline car is fitted with a 4-cylinder, 4-cycle engine of extremely simple and neat design. The car has a four-speed selective type transmission and a shaft drive. The four cylinders are cast in one piece. The cylinder dimensions are 3¾-inch bore and 5½-inch stroke. The stroke is longer in proportion to the bore, it is claimed, than in any other American car, the White construction being in accordance with the 1909-1910 practice of the leading foreign designers. The advantages of the long stroke are greater efficiency and higher economy.

A feature of the car is the unusually small amount of piping and fittings under the bonnet. The valves are all on one side and are actuated by a single half-time shaft. The valve springs are not exposed to view but may be inspected or replaced by removing a side plate.

There is neither an inlet manifold, an exhaust manifold, or a water manifold in

sight. Fig. 3 shows the left-hand side of the engine, on which side are located the valves and the spark plugs. At the front of the engine on this side is a centrifugal pump, from which a pipe leads to the water jacket. In the center, is the intake pipe leading from the carburetor. From the rear of the engine, the exhaust pipe leads to the muffler. The oil reservoir forms an integral part of the aluminum crank case, being located at the rear on the left side.

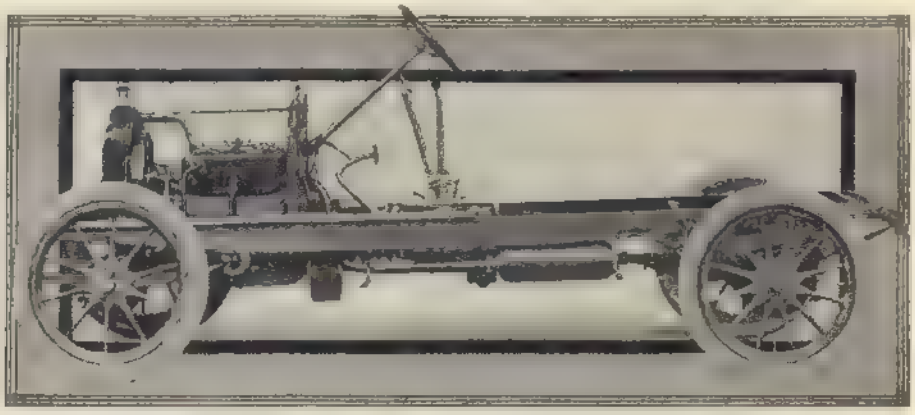


Fig. 3. Side view of the new White Gasoline car chassis. 4 cylinder motor cast "en bloc," 3¾ bore by 5½ inch stroke, no exhaust or inlet manifolds visible, self contained lubricating system, Bosch high tension magneto ignition. Crank shaft mounted on two main bearings only and these are of the annular ball type, leather faced cone clutch, selective transmission four speeds ahead and one reverse with direct drive on the third, shaft fitted with two universal joints to rear divided live axle, wheel base 110 inches. Price from $3000 to $3500 according to bodies and equipment.

There is no piping, except the oil leads, on the right side of the engine. The only device on this side is the gear-driven Bosch magneto, to which the timer is attached. The only wiring on the car consists of the four short wires leading from the timer to the spark plugs, and also the two wires leading to the switch on the dash. The crank shaft has but two main bearings which are annular ball-bearings of generous dimensions. The connecting-rod bearings are of Parsons' white metal. The oil pump is driven from the half-time shaft and supplies oil to the connecting-rod bearings and to the crank case by way of an adjustable sight-feed on the dash. The gears driving the half-time shaft, the water pump and the magneto are of fibre and metal and are completely enclosed. The radiator is of the "honeycomb" type and its shape follows approximately the lines of the condenser of the White Steamer.

The engine is attached to the cross-members of the frame by three-point suspension. The clutch is of the leather-faced cone type. The gear case is hung by three-point suspension on the cross-members of the frame. As already mentioned, the transmission is of the selective type with four forward speeds and one reverse. The direct drive is on the third speed. The drive from the gear case to the rear axle is by means of a shaft, fitted with two universal joints. The frame is of pressed steel, narrowed at the forward end. The wheel-base is 110 inches. The front axle is of I-beam section and all bearings on the wheels and in the rear axle are annular ball-bearings.

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## SOME 1910 SPEEDWELL IMPROVEMENTS

The Speedwell Motor Car Co., of Dayton, Ohio, intends using a dropped frame, that is, one arched over the rear axle, and by this means the entire body will be lowered 3½ inches. The tonneau length will be increased 7 inches, making it a comfortable seven-passenger car. The motor will be increased from 4¾ by 5 to 5 by 5 ins., with increased radiator capacity. All springs, bolts, strut rods, and, in fact, all bearings both inside and outside, will be provided with grease cups. An improved method of hanging the under pan by means of special hooks to the frame will be used, so that but a few moments will be required to release it. The steering post will have more rake and be fitted with an 18-inch steering wheel; the roadsters will be fitted with low seats and a gasoline tank at the rear.

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The St. Louis Car Co., of St. Louis, Mo., has been taken over by a new concern which it is said will build a 6-cylinder car of American design.

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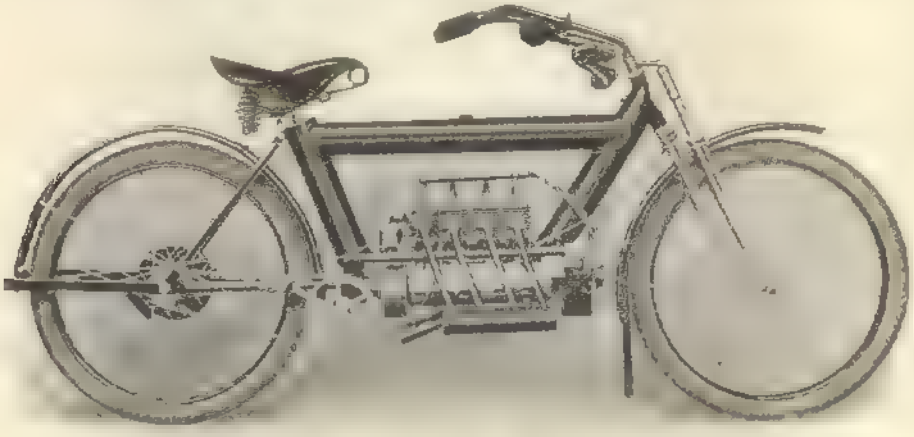
The Jewel Carriage Co., Carthage, Ohio, are now working on a high grade, 4-cylinder gasoline touring car for the 1910 market. This machine will be known as the Ohio.

# Details of "Pierce" 4-Cylinder Motorcycle

A preliminary announcement of the Pierce 4-cylinder motorcycle, manufactured by the Pierce Cycle Co., Buffalo, N. Y., was given in our November, 1908 issue, page 175. We give herewith a detailed description of this machine, together with sectional views of the motor and transmission.

THE FRAME

One of the particular features of this motorcycle is the frame construction, which entirely eliminates the use of gasoline and oil tanks. The frame is made of the best seamless steel tubing, the top, bottom and upright tubes being 3½ inches



The Pierce 4-cylinder [illegible] cycle has a [illegible] wheel base 60 inches, wheels 28 inches, [illegible] using no tanks used, force feed [illegible] Bosch magneto ignition [illegible] drive by shaft and bevel gear; pedal gear ratio, 66 motor ratio 5 to 1; price $350

in diameter by 18-inch gauge. The motor supports and right lower rear fork are 1-inch diameter by 16-inch gauge, and the left lower rear fork is 1 1 16 inches diameter by 13-inch gauge. The upper rear forks are ⅞-inch diameter by 16 inch gauge The head construction is particularly strong, the lower tube of the frame being flanged completely around the inner head tube, riveted down and brazed. The other main frame joints are also flanged, riveted and brazed in the same manner. The top and upright tubes of the frame contain the gasoline, capacity is 7 quarts, or sufficient to run the motor from 100 to 125 miles. The front tube contains the lubricating oil and has a capacity of 5 pints, which with the oil in the base of the motor (about 1 quart), is sufficient for from 800 to 1000 miles.

THE MOTOR

The motor is distinctly Pierce design, being of the same general type as that used in the Great Arrow automobile. It is, however, modified to meet the requirements of a motorcycle. There are four T-shaped cylinders separately cast of grey iron. The cooling flanges are made especially wide, giving extra good cooling surface. The cylinders are accurately machined and ground, the bore being 2 3-16 inches, and the stroke 2¼ inches. The pistons are of close grain gray iron and are fitted with three rings each. The crank shaft is one piece of nickel steel, accurately machined and oil treated. The bearings in the motor are all large being ⅞-inch diameter, the main bearing being 1⅜ inches long and the connecting rod bearings 1 3-16 inches long, all running in phosphor bronze. The cam shafts and cams are of one-piece steel, accurately machined. The valve gears, gears for driving the oil pump and magneto are made of hardened steel and run in oil The inlet and exhaust valves are mechanically operated and are placed on opposite sides of cylinders.

IGNITION

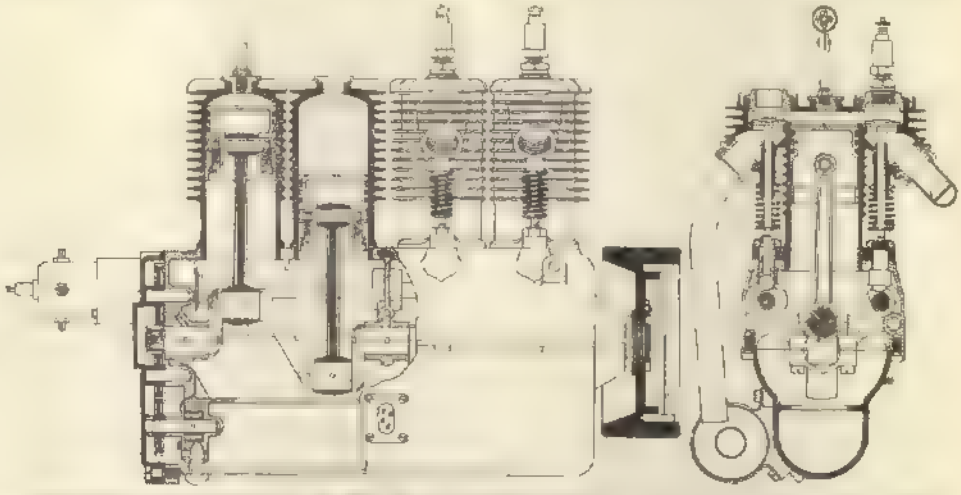
Ignition is of jump spark type by a Bosch high tension magneto, which is securely attached to the front of the motor.

LUBRICATION

Lubrication is by means of a force feed gear driven pump. The pump is located in front of the crank case and forces oil directly on the bearings whenever the engine is running. Thus the operator needs to have no concern on the subject of motor lubrication beyond having oil in the crank case. The gears on the motorcycle are packed with grease and do not need replenishing for a long time, it being found that if the gears are packed at the beginning of each riding season, little more need be done. The lubrication holes are provided in the housings of the front and rear drive shaft gears.

TRANSMISSION

The driving mechanism is by shaft and gears, a disc clutch in the fly wheel of the motor connecting with a pinion on a jack shaft, which, in turn drives the gear on front of the shaft running inside the left lower rear fork tube. This shaft has a bevel pinion on its rear end which engages a bevel pinion on the rear hub.



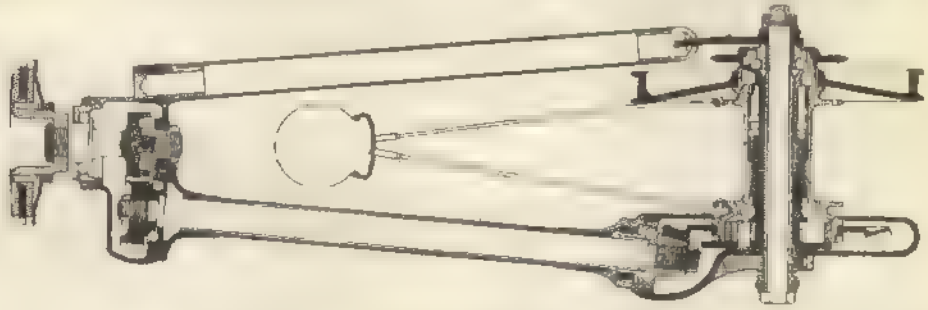
Sectional view of the four-cylinder motor. The cylinders are 2 3-16-in. bore by 3¼ in. stroke. Bearings 1 3-16-in. diameter, the main bearings 1¾ in. long and the connecting rod bearings 1 3-16-in. long running in phosphor bronze inlet and exhaust valves are on opposite sides of cylinders both mechanically operated.

The transmission is similar to that used on regular automobiles. The clutch can be quickly released in case of accident or lack of gasoline, by loosening two nuts back of the fly wheel, so that the machine can be pedaled without running the motor.

The driving gears run on ball bearings and are made of the best steel, carefully hardened. The gear ratio is 5 to 1.

The front shock absorbing fork is of heavy rigid triple crowned type. The ends of this fork do not connect directly to the wheel hub, but are attached to the front shock absorbing fork at the hub by means of steel links

The front shock absorbing fork is of itself, rigid, but the neck operates into a Pierce hygienic cushion cartridge. The cushion is a combined double pneumatic and helical spring mechanism, which it is claimed entirely eliminates vibration without transmitting the slightest tremble to the frame. The handle bars are of the V type and are held in the front forks by the well



Sectional view of the rear wheel driving mechanism, transmission and clutch, gear ratio is 5 to 1

CONTROL

The control is entirely by turning the grips with the exception of the brakes. Bowden wire tubes encasing piano wire, lead from the grips, through the handle bars to the throttle, magneto and exhaust valves. Turning the left grip operates the throttle, while the right grip advances and retards the spark, cutting it out just before raising the exhaust valves. It is said that the wires used in the controls are capable of sustaining over a ton in weight. One other wire control is used running from the hand lever on the handle bar to the emergency band brake

The front fork is of heavy rigid triple crowned type. The ends of this fork do not connect directly to the wheel hub, but are attached to the front shock absorbing fork at the hub by means of steel links known Pierce expander. Wide mud guards are provided, having a long sweep. The rear guard is hinged so that it can be raised to facilitate removing of the rear wheel.

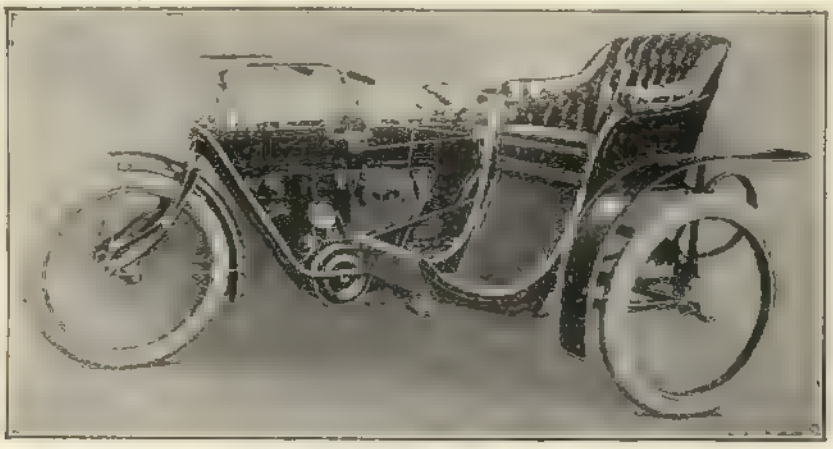
The wheels are 28 inches in diameter fitted with 2½-inch detachable tires. The wheel base is 60 inches. The carburetor is of the Breeze pattern. The main pipe of the manifold used on the motor has a partition to its center which effects the

even distribution of the gases. A very simple muffler is fitted consisting of two heads, an outer casing, a perforated inner tube terminating in a tapered nozzle at the rear, the whole being held together by means of a screw. A stand is fitted to the rear axle in such a manner as to permit the rear wheel being removed and the stand to remain in use undisturbed. The stand is an integral part of the frame.

Equipment, regularly supplied, includes tires, saddle, grips, tool roll and tools, and a large sized tire pump. In tires any American make is furnished with any type of standard tread including Bailey; option is given on either Mesinger, Persons or Truxel saddle. The regular finish is in black enamel, while Pierce red is offered as the sole option. A tandem attachment can be furnished at $15 extra without saddle and a detachable side car at $125 extra. The price of the machine, as illustrated is $350.

## THE "N. S. U." SIDE CAR

The cut herewith shows a 6 H. P. Model de Luxe, N. S. U. motorcycle, fitted with side car attachment. This outfit is manufactured by the N. S. U. Motor Company, 206 West 76th Street, New York City. The motor is 2-cylinder, measuring 75 m. bore by 90 m. stroke, which provides ample power for pulling the side car attached, and for which this model is specially adaptable. The engine, which is very low in the frame, has mechanically operated inlet valves, worked by overhead rockers, and the front cylinder is in a more inclined position forward than on most twin's, which permits of cold air reaching the rear cylinder for cooling purposes. The magneto is in a very protected position behind the crank case, and is gear-driven.



The "N. S. U." Side Car

New pattern spring forks, which are much neater in appearance than on last year's model, and extra long handle bars are fitted, and all road shocks should be effectively absorbed. The wheel base measures about 60 inches. The stand and luggage carrier form part of the standard equipment, in addition to a very neat metal tool case fixed in the frame under the saddle. A great convenience when dealing with tire trouble on the rear wheel is the removable mud guard, which may be completely detached, leaving the wheel entirely exposed.

The N. S. U. two-speed gear and free engine clutch is fitted on the engine shaft and operated by a convenient lever on the top tube. For those who prefer it, the gear can be fitted in the rear wheel. A fan is fitted which serves to insure the engine keeping cool when the low gear is used for hill-climbing with the side car. This is of the rigid variety, and is substantially built. The seat is coach-built and well upholstered. The side car can easily be attached or detached to the motorcycle in a few minutes, and is so fitted to the motorcycle that the back wheel of the same can easily be taken out for repairs.

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The Plainfield (N. J.) Motorcycle Club was recently organized, and the following officers elected: President, Dr. W. H. Anthony; Vice-President, Douglas Martin; Secretary and Treasurer, Allen Fulmer, Captain, Arthur Hurlick; Lieutenant, Bud Howard.

World's records were made at Los Angeles, California, on the 3½-lap board track by a 7 H.P. N. S. U. motorcycle for one, five and six miles, as follows: One mile, 46 4-5 seconds; five miles, 3 minutes 59 seconds, and six miles, 4 minutes 47 seconds. These records were made by M. J. Graves.

# Inauguration of Indianapolis Speedway

## ACCIDENTS MAR MEET BUT RECORDS ARE BROKEN

The inauguration of the great Indianapolis Motor Speedway witnessed the breaking of American track records, and the loss of several lives.

The feature of the opening day was the 250-mile race, won by Robert Burman, in a Buick. The winner's time was 4.38 57 4-10, comparatively slow because of the many accidents that marred the race. It was during this event that William A. Bourque, driver of the Knox car, and Harry Holcolm, his mechanician, lost their lives due to the overturning of their car when the latter left the course about

300 yards north of the grandstand. The car turned over when it left the track and pinned both men beneath it, both men being so severely injured that they died within the hour.

As a result of the two deaths the Knox Company recalled all its remaining entries. In the 250-mile event the following cars started: Knox (Bourque), National (Kincaid), National (Merz), Stoddard-Dayton (Miller), Buick (Burman), Buick (Strang), Buick (Chevrolet), Jackson (Ellis) and Stoddard-Dayton (Clements).

For the first 52 laps or more than half the race, Chevrolet held the lead with a brief exception of the 15th and 16th laps, when he relinquished it to his teammate, Burman, the winner. During these laps Chevrolet was blinded by dust and was led from the track and his car withdrawn. After his withdrawal Burman again went into the lead with Bourque 2nd, and Kincaid, in a National, 3rd. This order continued until the fatal accident to the Knox, when Kincaid moved into 2nd place and Ellis, in a Jackson, 3rd. Burman led until the 82nd lap had been covered, when he dropped back to 2nd place, while Ellis, who had passed Kincaid, took the lead. With the Jackson out of commission, Burman was able to regain his lead with Clements 2nd, and Kincaid 3rd, in which order they continued until the finish.

The first event of the day was a five-mile race, in which there were five entries—two Stoddard-Daytons, driven by Wright and Schwitzer; two Buicks, driven by Dewitt and Ryall, and one Velie, driven by Stickney. The time of the winner, a Stoddard-Dayton, was 5.18.4.

In the 10-mile event there were eight entries; three Marions, two Marmons, and three Buicks, the latter being driven by Chevrolet, Strang and Burman, who finished in the order named. Time, 8.56 4-10. This time was broken, however, the second day by Zengle in a Chadwick stock car when he made his sensational run, the fastest time ever made in America on a circular track by a stock model.

The third race was a five-mile event with a Knox, driven by Bourque, three Stoddard-Daytons, driven by Hymel, Miller and Clements; three Buicks, driven by Burman, Strang and Chevrolet, and two Jacksons, with Lynch and Ellis as drivers. The race was won by a Buick, by a half length in 4.45½, beating the American record for the same distance.

In the 10-mile handicap there were 22 starters. Stallman driving a Marmon, finished first in 8.22 1-5.

### SECOND DAY

Strang captured the 100-mile race for the G. & J. trophy in 1 hour 32 minutes and 48½ seconds. His teammate, George DeWitt, also driving a Buick, ran second, with Stillman, in a Marmon, third.

Strang's achievement was by no means the only thriller on the bill. To many of the 15,000 spectators the ten-mile free-for-all, won by Zengle in the Chadwick, was the hair-raising performance of the afternoon.

In this race Zengle in the stock Chadwick, the star of the Algonquin hill climb

averaged more than seventy-three miles an hour, traveling at a faster clip than had ever before been maintained by a stock car on any circular course in America. Zengle drove like mad and the big "Six" literally flashed through space, doing the distance in 8m. 32 2-5s. In the 5-mile free-for-all handicap Merz with a National, finished first. Thirteen cars started in this event, and they were divided into four classes according to handicap.

THIRD DAY

This day resulted in the sacrificing of three more lives. One mechanician and two spectators were killed. The fatal accident happened in the 300 mile race, when a National car, driven by Charles Merz, shed a tire and crashed through a fence into a group of spectators. Kellum, his mechanician being killed. Merz escaped with a few bruises. Besides the three deaths, two serious injuries resulted during the day. Henry Tapking, of Indianapolis, was seriously injured in the fatal wreck, sustaining a compound fracture of his right arm, a broken nose and several scalp wounds.

Bruce Keene, the driver of a Marmon car in the same race, crashed into a post shortly after the National wreck and was badly cut on the neck and head.

After the second accident the officials decided to call off the 300-mile race, when the leading car, Jackson, with Lee Lynch at the wheel, had covered 235 miles. Ralph De Palma, in a Fiat, was second, and Stillman, in a Marmon, was third. The race was declared no contest, and the great Indianapolis Motor Speedway trophy will be raced for again.

Barney Oldfield, in his big German Benz, smashed into small fragments the world's records for five, ten, fifteen, twenty and twenty-five miles in the fourth race, the Remy-Grand Brassard, a twenty-five mile free-for-all event.

In this race the other starters were Zengle in a Chadwick and De Palma in a Fiat. Oldfield's time in his 120 H. P. racing Benz for 10 miles was 8.15 9-10, thus breaking Zengle's time of 8.32 2-5, made the second day of the meet in the regular stock Chadwick car.

## CHADWICK BREAKS ALGONQUIN HILL CLIMB RECORD

The Chadwick Six, stock runabout, which broke the record on the Wildwood course on July 5, again achieved high honors on August 5, at the Algonquin hill climb at Algonquin, Ill., when Len Zengle drove it to victory and lowered the record for the course by three seconds. The time was: Perry Hill, 22 3-5 seconds, and Phillips Hill, 28 seconds.

The Great Chadwick had the distinction in this event of triumphing over more than fifty representative entrants, beating them out by a generous margin.

The car was shipped out only a few days ago and Zengle had his first try at the hill since then.

The time for each car made on each hill was recorded separately and the totals constituted the time of the winner. In the $850 and under class, the Maxwell and the Hupmobile were the only ones that appeared. The Maxwell made the two hills in 1.47 1-5. In the $851 to $1250 class, Dusenberg in a Mason car negotiated the hills in 1.13. An Oakland car, driven by Howard Bauer, made the Perry hill in 31 4-5, and the afternoon ascent in .39 4-5, total, 1.11 3-5. This was in the $1251 to $2000 event.

The $3000 to $4000 class was strictly Stoddard-Dayton, the winning car, driven by Englebeck, doing the hills in 59 seconds total. In the electric class a Babcock negotiated Perry hill in .34 1-5, and Phillips in 47 seconds, a total of 1.21 1-5.

In the motor buggy class the Holsman automobile again took the honors and retained its unbroken record.

In the stock chassis class a Buick won in the 160 cubic inches and under displacement class, time, 1.25 3-5. A Velie car, driven by Stickney in the 161 to 230 cubic inches displacement, made the hill in 1.03 4-5. The 233 to 300 cubic inches event was captured by Bird, driving a Corbin, total time, 1.03 4-5. The 301 to 450 cubic inches displacement event was won by a Buick, time, .56 3-5, and the 451 to 600 cubic inch event by a Knox, .53 3-5. A Velie, driven by Stickney, also captured the chassis not over 202 cubic inches event, time, 1.09. Under 300 cubic inches class was captured by the Stoddard-Dayton, driven by Miller, .56 2-5.

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The Aluminum Castings Company, 530 Leavenworth Ave., Syracuse, N. Y., has acquired the properties and business of The Allyne Brass Foundry Company of Ohio, The Allyne Brass Foundry Company of Michigan, The Allyne Brass Foundry Company of New York, The Syracuse Aluminum and Bronze Company, The Eclipse Foundry Company, and the Foundry Department of The United States Aluminum Company. It is the intention of The Aluminum Castings Company to continue to operate these plants under the same management and with the same attention to details as heretofore, and to equip them with improved appliances.

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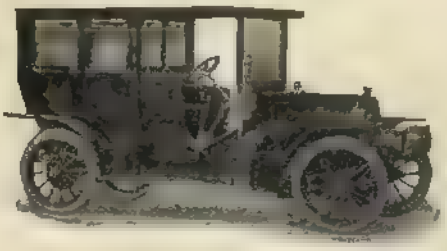
Correction: The G. L. Economizer Co., 8 Thoroughfare Bldg., 1777 Broadway, New York, informs us that the price of its Economizer is $10, and not $5 as stated in a description of this device in our August issue, page 136.

# THE JEWEL "40"

MODEL "K" ROADSTER

MODEL "M" CLOSE COUPLED BODY

MODEL "G" TOURING CAR



MODEL "H" LIMOUSINE

## FOUR MODELS

A car for every purpose, from the sturdy roadster to the luxurious limousine, and each priced consistently with mechanical perfection, beauty of design and elegance of finish.

The Jewel has been on the market long enough to place it beyond the experimental stage. Hence it is **an absolutely** safe purchase, either for the dealer or individual.

Each model has the Rutenber Motor, double ignition system, Truffault-Hartford Shock absorbers,—in fact the equipment is of the highest grade throughout.

**Model G—7-passenger Touring Car - $3,000**

**Model H—7-passenger Limousine - 4,000**

**Model K—Roadster - 1,900**

**Model M—5-passenger Close Coupled Body, 3,000**

We want good representatives in territory not already covered.

## CROXTON-KEETON MOTOR CO.

**Successors to**

**THE JEWEL MOTOR CAR COMPANY**

**Factory and General Offices: MASSILLON, OHIO**

**BRANCHES**

**NEW YORK, 1662 Broadway** **CLEVELAND, 2174-80 E. 9th St., S. E.**

**Pittsburg, 5920 Baum St.**

**AGENCIES:**

Boston L. F. Withered 216 Pleasant St

Toledo: The Standard Garage, 233-5-7 Ontario St

Kansas City The Rhodes Implement Co., 1308-10 W. Eleventh St.

Oakland, Cal. D. E. McCabe, Keystone Garage.

Chicago: The S. H. Peterson Automobile Co., 1220 Michigan Ave.

SOME VIEWS OF THE INDIANAPOLIS MOTOR SPEEDWAY

No. 1. View showing the first cars to encircle the speedway and in the background one of the partly finished stands.
No. 2. Showing the outside of the embankment of the curves. This embankment is from 12 to 15 feet in height.
No. 3. General view of the Indianapolis Motor Speedway as it will appear when completed.
No. 4. Showing the 12-ton roller at work on one of the curves. This view gives a fair idea of the width, which is 60 feet on the turns.

# The Indianapolis Motor Speedway

America is not to be outdone by England in the matter of a Motor Speedway. Brooklands track has shown its utility and this country is now completing in the middle West a very similar motor park, or track known as the Indianapolis Motor Speedway, of Indianapolis, Ind.

This speedway is in many respects, unique. The work has been put through in an expeditious manner and the speedway will be officially opened in August with a three day meet at which it is expected all records will be lowered. On June 5th, even before the completion of the park, the National Championship Balloon Race of the Aero Club of America was started there, the public being admitted for the first time within the gigantic enclosure.

SOME STATISTICS.

The grounds contain 328 acres and are located 3½ miles N. W. of the center of Indianapolis and are accessible by means of one mile of improved road connecting with the elaborate boulevard system of the city. The New York Central Railroad is to have a 2,000 foot switch on the grounds with a railway station and unloading platform, as well as ample side track facilities for the shipment and unloading inside of the grounds, of racing cars and other vehicles. An interurban car line also passes the southwest corner of the grounds having passenger and freight facilities

The speedway proper is a two mile circular track, 50 feet in width on the straightaways and 60 feet on the curves, which are banked from twelve to fifteen feet in height so that in the judgment of the engineers, the cars will be able to take these curves at the highest possible speed, even as high as two miles a minute. Inside of the main track and connecting with it, is a road racing course of three miles in length, thirty feet wide in the straight portions and thirty-eight feet wide on the turns which are also well banked so that the cars will be able to make from sixty to sixty-five miles on the curves. The outside and inner track together, measured three feet from the pole line, make a total of five miles. Every effort has been made to produce the safest high speed motor race course in the world. The tract of ground is entirely level and the course is so constructed that it merges into the level ground, except on the banked turns. There will be no fences or buildings closer than 100 feet to the course and the parking spaces and grandstands will be divided from the main grounds by eight foot wire fences, making it impossible for spectators to get on the track at any point.

There will be three main grandstands with a total seating capacity of thirty-five thousand and twenty individual grandstands for clubs and parties, each having an accommodation for fifty persons and all giving perfect views of the track. There will be parking space for one thousand five hundred automobiles.

The track surface will be of gravel having mixed with it three hundred thousand gallons of asphalt oil, which has been tested and shown to produce a fast and dustless surface, capable of resisting rain. Over three miles of fence enclose the grounds and the course will be provided with four hundred and twenty independent electric arc lights, each provided with reflectors throwing the light ahead of the driver, making twenty-four hour races possible and safe. It is expected that an electric timing and score board will be erected at a cost of over $10,000. Four miles of six-inch gas main have been laid from the works of the Indianapolis Gas Co., for inflating balloons and dirigibles and there will be forty-one buildings including the grandstands, garages, aerodromes, club houses, machine shops, oil houses, refreshment and office buildings. The total cost of the speedway will probably exceed $350,000. It is expected that the entire grounds will be able to accommodate two hundred thousand spectators, all of whom can view the races from points of vantage yet with entire safety.

The press stand is to be one of the largest ever built, being three stories high, the top floor to be used for reporting the progress of the races, the second floor fitted for telegraph operators, and the ground floor equipped with dark room facilities for developing press photos taken on the track.

The comfort of the racing teams has also received attention, ten buildings having been erected for their use, each building holding a team of three cars. There will be sleeping accommodations provided in each building for the members of the teams. There will also be two general larger garages accommodating twelve cars each and for the officials, a club house which it is claimed will have all the conveniences of a city club house. A large restaurant, capable of caring for hundreds of patrons will also be located on the grounds and in addition there will be numerous refreshment stands.

The construction of this track will make it possible for American manufacturers to thoroughly test our cars entered for any long distance events and suitably prepare the cars in advance, they can test out new ideas, special parts, designs, etc., and a

special schedule and arrangement of privileges for a nominal cost will be provided for the benefit of makers.

EVENTS

There are to be a series of events over this new speedway, beginning with the three day August meet, previously mentioned. The first day there will be record trials and short distance events for stock cars and for free-for-all racing cars, in which most of the well known American drivers will participate. This will be followed by long distance events for Voiturettes. On the second day record trials will be continued and a stock car race for professionals, which will be a long distance classic event, will be held for the Prest-O-Lite trophy, having a metal silver value of $1000. On the third day there will be a finish of the short event finals and a special purse for the fastest mile, followed by a great international heavy weight stock chasis race. This will be for the $5,000 Wheeler Snebly Trophy, claimed to be the most valuable cup offered for such a sporting event. The race will be from 350 to 450 miles, and it is expected that there will be at least twelve American teams and so many requests for information and entry blanks have been received from the foreign makers, that one of the greatest fields of foreign cars ever seen in this country will participate.

In September there will be two international contests, one for balloons, dirigibles and aeroplanes, at which it is intended to have the greatest of aviators, the Wright Brothers. The other event will be an international twenty-four hour race. Plans are also being made for an international long distance race to take place in October, using both the speed way and the inside road course.

## WILKESBARRE HILL CLIMB

Held annually, under the auspices of the Wilkesbarre Automobile Club, the climb up the Giant's Despair Mountain on May 31 was a marked success. There was only one accident and that did not result seriously. Louis Chevrolet upset at the "S" turn in his Buick car, but was not badly hurt.

David Bruce Brown broke all records for that course, driving his 120 H. P. Benz car up the steep hill in 1 minute and 31 3-5 seconds, beating the lowest previous time by 6 4-5 seconds.

The summary, giving the winner of each event, together with the car, time and kind of tires used, is as follows:

Automobile Event No. 1—Cars selling for $850 and under.—Maxwell (Arthur Lee), Ajax Time—2 38 1-5

Event No. 2—Cars selling from $851 to $1,250.—Buick (L. Chevrolet), Michelin. Time 2 34 2-5

Event No. 3—Cars selling from $1,251 to $2,000.—Oakland (Howard Bauer), Dunlap Time 2 31 4-5

Event No. 4—Hollenback trophy; cars selling from $2,001 to $3,000.—Knox (Dennison), Pirelli. Time

Event No. 5—Cars selling from $3,001 to $4,000.—Steddard-Dayton (Miller), Michelin. Time—1 50 1-5

Event No. 6—Cars selling for $4,000 and over.—Simplex (Watson), Michelin. Time—1 48 2-5

Event No. 7—Six cylinder cars selling for $3,000 and over—National (Merz), Michelin Time—1 48

Event No. 8—Free for all Benz (Brown), Michelin. Time—1 31 3-5

David Bruce Brown in the record breaker Benz [illegible] winner of the free-for-all in the hill climb on May [illegible] same car also made a new record of 51 1-5 seconds by [illegible] Spriggle Hill, West Haven, Conn., on May 26.

**As the result of the initial announcement of the**

# KOEHLER "40"

## $1650.00

in the last issue of this Journal, it has been proved that the KOEHLER "40" is the right car at the right price. Experienced Dealers and Owners everywhere instantly recognized by the description and specifications that the KOEHLER "40" represents the greatest value for 1910 and we think that we are fair in stating that no one advertisement ever brought as many inquiries from all parts of the country, which is conclusive evidence that the KOEHLER "40" meets the popular demand throughout the United States for a high-grade, high powered and handsome Touring Car at a price which has heretofore been charged for much smaller cars of inferior material, workmanship and appearance. Its details of construction, its equipment, its body design and in fact all its features, are those of the type and quality of cars offered for 1910 at $2500 or more. The type of the body, known as the "Montclair," is absolutely one of the most exclusive, stylish and luxurious placed on a car selling for less than $5000. It has the appearance of being a masterpiece of the leading Parisian body builders and it but portrays the excellence of the car throughout We are continually asked: "How is it that you have so thoroughly met the popular demand and how are you able to give so much for so little?" That our car is what everyone has been looking for, is due to our knowing what dealers and owners want, which knowledge is the result of twelve years' experience in wholesaling and retailing automobiles, thus being in daily touch with the public and its wants. How we can give so much for so little is the result of three things. First, our practical knowledge of the automobile business; Second, our economical methods of marketing, and Third, our willingness to accept an ordinary profit instead of the usual dividends of Automobile Makers. The motor is 4 cylinders, 4 cycle, 4¼ bore by 5 stroke, water cooled. Ignition by Magneto and battery. Transmission, sliding gear, selective type, three speeds forward, one reverse. Wheel base, 112 inches and wheels 34 inch. Brakes, two separate systems. Equipment includes in addition to the Magneto, two large gas headlights, two dash lights, one rear light, generator, tube horn, robe rail, general tool kit, jack, pump (tire), tire repair outfit and tool box attached to running board In other words, the same kind of equipment expected and received on a $5000 Automobile.

¶ We would be pleased to give you complete set of specifications and full details. It is the easiest selling car in America and therefore is a great proposition for progressive dealers.

# DEALERS

*We can give you the most complete and Best Selling Line in the United States for 1910. It includes the*

¶ HUPMOBILE, 4 cylinder Runabout, $750.

¶ RIDER-LEWIS, 4 cylinder, 5 passenger Touring Car, $1050.

¶ RIDER-LEWIS, 6 cylinder, 7 passenger Touring Car, $2500.

¶ KOEHLER "40," 5 passenger Touring Car, $1650.

¶ We are general distributors for the following cars in the territory herein specified:

## KOEHLER "40"---The United States

¶ This car is all that our twelve years' experience has taught us that the car should be, in material, workmanship and appearance, and sells at a price that defies competition. Special attention is called to the body equipment the type is the "Montclair," the finish is par excellence. Nothing approaches it in appearance on cars selling for less than $5000.

RIDER-LEWIS New York, New Jersey, Pennsylvania, Delaware, Connecticut, Rhode Island, New Hampshire, Vermont, Massachusetts.
4 Cylinder, 30 Horse Power, 5 Passenger, $1050; 6 Cylinder, 7 Passenger, $2500.

HUPMOBILE New York (east of Buffalo), North-eastern and Central Pennsylvania, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut.
4 Cylinder, 20 Horse Power, 2 Passenger Runabout, $750.00.

¶ Write us now for agency proposition and represent the best selling line for 1910.

*FALL DELIVERIES ON ALL CARS*

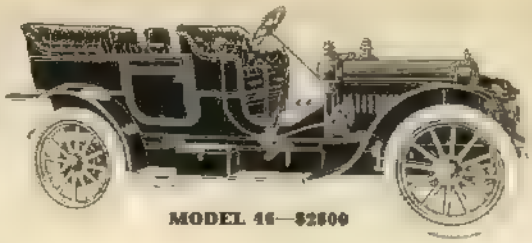
## H. J. KOEHLER CO.

## 1711 BROADWAY, N. Y. CITY

## The 1910 Elmore

Model 36

Supplied as Five Passenger Touring Car
Four passenger, four cylinder detachable Demi Tonneau
Four cylinder Demi Tonneau Coupe
Four cylinder roadster



MODEL 46—$2500

## The 1910 Elmore

Model 46

Supplied as

Seven passenger, four cylinder Touring Car

Seven passenger four cylinder Limousine

# Any 1910 Elmore will take a 6 to 8% grade at 35 to 40 miles an hour

**Any 1910 Elmore will take a 9 to 10% grade at 25 to 30 miles an hour**
**Any 1910 Elmore will take a 15 to 16% grade at 23 to 26 miles an hour**

The ability of the seven passenger 46 H. P. Model 46 Elmore to travel 80 miles an hour is not the true measure of its merit.

Nor does the capacity of the five passenger 36 H. P. Model for 50 miles an hour give an adequate gauge of its extraordinary value.

Any Elmore will perform this speed on the straightaway. It's the car that eats up the hills without slowing down—that shows its true mettle on the upgrade—that gives you your money's worth.

A one hill climbing stunt—with a car stripped and tuned for the occasion—should be accepted as assurance of reliability.

That's why we say "any 1910 Elmore will take a 6 to 8% grade at 35 to 40 miles an hour."

We do not understand, cite this as an extraordinary performance. Racing cars and cars specially built for the occasion will take any hill at better speed but there is no value in such performances. In fact it has been demonstrated that they are detrimental to the machinery of cars.

We say the Elmore is the only car built that can stand the strain to which such performances subject an automobile. The real test, that proves the value of the car, is not what it can do once, or for a week; but what it can do after a year's use.

The Elmore car is unsurpassed in this—that it will maintain its power, and speed, and hill-climbing ability throughout the year; and continue to grow better and better. No other car can maintain its initial ability as the Elmore does without extensive and continuous repairing.

It is standing up to the work that counts—not the record of a few perfect days.

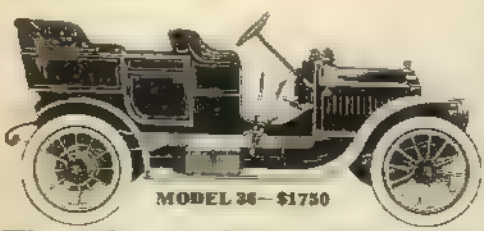
Combine that capacity with the guarantee of a lower cost of maintenance than any other car in the world—demonstrated over and over and over again in every city where the Elmore is sold and emphasized this year by vital improvements which leave it without a serious rival on the score of economy.

Add to that the simplicity of just three moving parts on the engine—and then ask yourself if there's a four cylinder car on the market that compares in value-for-the-money with the Model 36, 36 H. P. Elmore at $1750.00.

Four cylinders, 36 horse power; ample capacity for five passengers, a speed of 50 miles an hour, no valves, only three moving parts on the engine, power on the upgrade as described above, the continuous impulse of the two cycle engine and the superb smoothness known only to motor type Elmore adjustments. Doesn't this ideal car at $1750.00 shrivel into absurdity, by comparison, the average four cycle car of approximate price, with its costly clutter of complicating parts and its stuttering application of power?

An intensely interesting study—these two Elmore powerplants. The repetition of the same magnificent sales success year after year has been justified. The cars are marvels. And the 1910 models go far beyond the previous cars.

If you are not advised concerning them by all means send for the 1910 literature. If you are an Elmore enthusiast, send for it anyway and see how magnificently your favorite car has progressed.



MODEL 36—$1750

# The Elmore Manufacturing Co.

**904 Amanda Street, CLYDE, OHIO**

Member Association of Licensed Automobile Manufacturers

THE ELMORE MFG. CO.,
904 Amanda St.
Clyde, Ohio

Gentlemen:—Send me the advance literature describing the 36 H. P. 5 passenger Elmore valveless two-cycle car at $1750 and the 46 H. P. 7 Passenger Elmore at $2500.

Name .....

Address .....

Town ..... State .....

# Did You Notice What the *Moline* Did in the Glidden Tour?

## It Did More Than Make a Perfect Road Score

IT finished with honors never before achieved by a car of its cost and in the hottest kind of competition.

¶ It finished the 2650 miles with a *Perfect Road Score* in a tour in which the route was the toughest ever experienced.

### It Was The Only Car Listed Under $4000 That Made A PERFECT SCORE

in the Hower Trophy class. Its daily performance throughout the Tour was the center of interest and a marvel to motorists, especially those owning high priced cars

¶ On the hills and in the deep sand and rough, stony roads, its remarkable hill-climbing ability, speed and smooth running enabled it to out-road cars costing thousands more

¶ In reporting the finish of this exceptionally strenuous endurance contest, the Chicago Sunday Tribune of Aug. 1st tritely summed up the phenomenal performance of the Moline as follows:

*"The Moline won all the fame it needed."*

¶ And it did it without any fuss and feathers. It was

### The Only Car in the Entire Tour That Carried Absolutely NO EXTRA PARTS

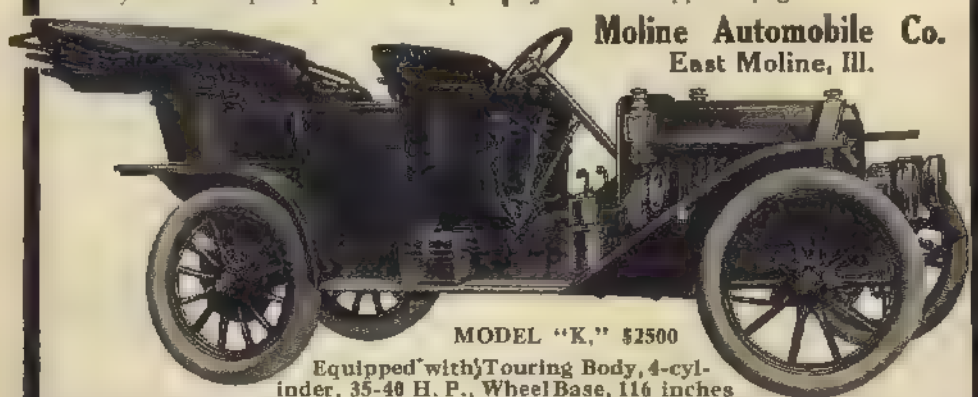
¶ What better evidence could you ask as to *dependability*, *efficiency*, *real worth* than such a showing under such trying circumstances as existed on this Tour.

¶ And, remember, to make such a *Perfect Road Score*, not so much as the loosening of a burr, pin, lamp, etc., can occur. But the Moline is built on honor and proved it alongside of cars costing thousands more.

¶ You can pay more, but you can't get more real value or a car that will give you better satisfaction.

¶ Read the opposite page.

**Moline Automobile Co.**
**East Moline, Ill.**



MODEL "K," $2500

Equipped with Touring Body, 4-cylinder, 35-40 H. P., Wheel Base, 116 inches

## THE CAR FOR ANYWHERE

# A Regular Stock Model 1910

# Chadwick

# Wins Algonquin Climb

*The Chicago "Record-Herald's" first paragraph of Algonquin story.*

The Chadwick "Six" running true to Eastern dope, simply annihilated speed records yesterday in the fourth annual hill climb of the Chicago Motor Club on Algonquin's classic slopes. Not content with his time-destroying achievements on Perry Hill in the morning trials Zengle waited his turn—the last on the card—and in the afternoon assault on Phillips Hill sent the powerful monster careening up the eleven per cent grade, a half mile long in 0.28.

*From the Chicago "Inter-Ocean's" story of Algonquin race.*

Chicago motorists were shown yesterday the reason why the Great Chadwick Six lays claim to the reputation of being the most efficient hill climbing automobile manufactured in America. A machine of this make literally burned up the hills yesterday in the annual contest of the Chicago Motor Club at Algonquin.

The Great Chadwick Six won the feature events of the day's program which included tests on Perry Hill during the morning and Phillips Hill during the afternoon when it registered the phenomenal time of 0.50 3-5 for the two ascents, much better time than many of the cars were able to accomplish on one of the hills.

The identical victorious Chadwick or its exact duplicates, for sale at catalog price—Chadwicks are positively the fastest stock cars in the world, yet they will throttle down to a walk on high gear, which qualifies them as particularly desirable for Touring and Town use.

Representatives in the leading cities.
New Catalog is ready for Distribution.

**CHADWICK ENGINEERING WORKS**
POTTSTOWN, PA.

# Now Take a Look at the *Moline* Model "M" for 1910

## A Proven Winner at a Popular Price

THE Moline Model "M" for 1910 is a ***larger, longer, handsomer*** car in several respects than last year's model.

¶ In material; in construction; in dependability; in durability; in everything essential for service and value to the buyer, we could not improve very much on last season's car as is evidenced by our results in the recent Glidden Tour.

¶ ***But*** we have added to these ***Sterling Qualities*** some features which make the 1910 Model far more desirable

### Longer Wheel Base

¶ We have added 3 inches to our wheel base, making it now 110 inches This m ans easier riding and more classy effect. Springs are 2 inches wide—last year's were 1¾. Hood is 2 inches longer and the motor dimensions are 4 x 4½ as against 3⅞ x 4½ of last year, making it

### The Only $1500 Car

that looks as well as a $4000 car and which has proven equal to $4000 cars in actual road performance.

¶ The same big 34 inch wheels and tires of last season are on the 1910 Model

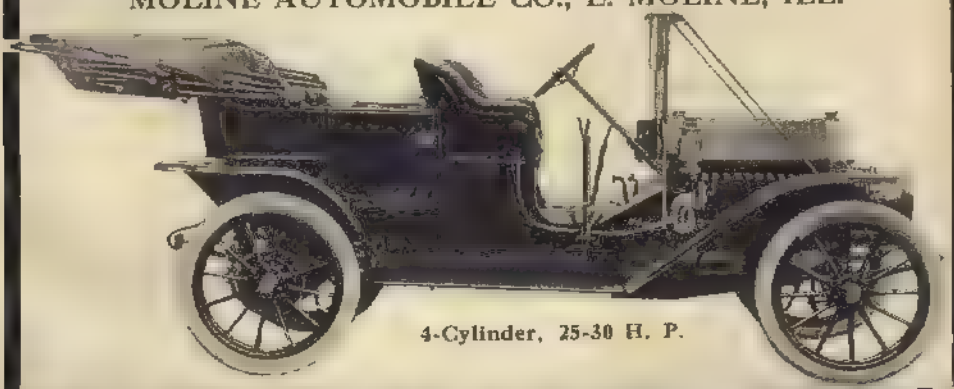
### Handsomer Lines

¶ In beauty, symmetry and style this year's model is a decided improvement over our 1909. Note its classy lines. Frame has been dropped in the springs, giving that deep, comfortable, luxurious appearance so much desired and making the Moline 1910 compare in style with any high priced car. We know in performance it can't be beat—it has proved that.

### Magneto Without Extra Cost

¶ This is another evidence that we intend to give our patrons the fullest value —the greatest $1500 car on the market. You can pay more but you can't get more. You take chances of getting much less. It is none too soon to get in your reservations. We're going to be "snowed under." First come, first served. Write for advance catalogue "10."

MOLINE AUTOMOBILE CO., E. MOLINE, ILL.

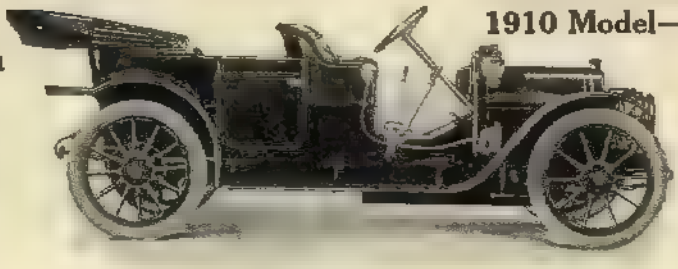


4-Cylinder, 25-30 H. P.

## PRICE, $1500, WITH MAGNETO

**Chalmers-Detroit "30"**
**1910 Model—$1500**

**touring Car**
**Pony Tonneau**
**Roadster**
**Limousine**
**Coupe** (*Inside Drive*)
**Landaulet**



# The Cars of

The man who takes care to get the most for his money will always choose one of the Chalmers-Detroits.

These cars have not become such a sensation without a good reason behind them.

Last season our orders exceeded our output by $1,200,000. This season, with a largely increased capacity, our whole output was taken by dealers before the first car was delivered. Within six weeks after commencing deliveries, one-third our whole year's output had been sold to users.

Such things do not happen without a good reason. And the reasons, if you look them up, will appeal to you.

## This for $1500

The Chalmers-Detroit "30" sells for $1500. These are some of the facts about it:

The wheel base is 115 inches—please mark that. That means plenty of room in the tonneau—all the appearance of a costly car; also easy riding.

The wheels are 34 inches. The engine since last year has been increased in power. The lines are exquisite. There is not a suggestion of cheapness anywhere about the car.

This car has a long-distance speed record of 55.5 miles per hour. This is the car which won the Indiana Trophy. This is the car which made the path-finding trip between Denver and Mexico City. And the car has endurance records such as no other car at any price ever equaled.

We fit our "30" with a Bosch magneto, a gas tank and two gas lamps for $100 extra. The regular price of these extras is $175.

We add a Lenox mohair top—a regular $125 top—for $75 extra. These extras are sold on the same basis as the cars.

## This for $2,750

The Chalmers-Detroit "Forty" sells for $2,750, Bosch magneto, gas lamps and gas tank included.

This car has a 122-inch wheel base, and room for seven passengers. The wheels are 36 inches. The upholstering is hand-buffed leather.

There is nothing in any car at any price to excel it, unless you want excessive power with its excessive cost of upkeep.

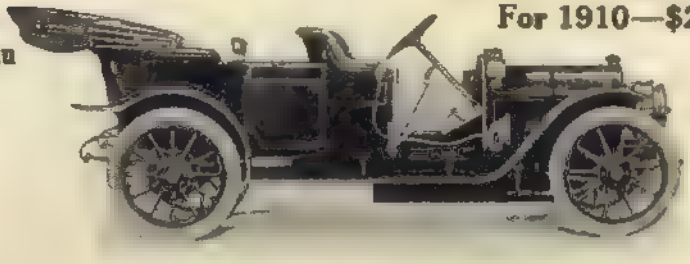
No road is too rough for our "Forty," no hill too steep, no desirable speed that is beyond its reach.

There was never a car more satisfactory, as every owner knows. To pay more for a car is simple extravagance. No man knows how to make any part better. We fit this car with a Newport mohair top—the finest top we can buy—for $125 extra. The two extra seats in the tonneau cost $75.

**Chalmers-Detroit Motor Company,**

**Chalmers-Detroit "Forty"**
**For 1910—$2,750**

**Touring Car**
**Pony Tonneau**
**Roadster**



# the Careful

## The Moderate Price

The question of price is a minor one compared with the worth of a car. An inferior car is never a cheap car, however little it costs.

But the Chalmers-Detroits—both the "30" and "Forty"—are Mr. Coffin's designs. And no engineer has a better reputation for designing perfect cars.

There are scores of records, and thousands of owners to tell what these cars will do.

The reason for the price is the simple fact that we sell on nine per cent profit. The policy of our business is to give the utmost for the money. That is the reason for our amazing success.

No car selling near the price of our "30" gives what our "30" gives. No car at any price gives more than our "Forty." These facts are easily proved by a simple comparison, and it is due to yourself that you make them.

## Economy in Vogue

Experienced car buyers seek economy now—not only in cost but in upkeep.

To pay a high price because some maker asks it has come to be known as poor business.

To maintain a heavy, over-powered car costs more than most people care to pay.

Our "30" has an economy record of 25.7 miles on one gallon of gasoline. For the year ending June 1, owners paid us for repair parts just $2.44 per car. Owners who know what some cars cost are seeking such cars as these.

We are selling our $1500 car to some of the wealthiest men in America. We are selling it to engineers with a nation-wide reputation. Names will be given when we send you our catalog.

The Chalmers-Detroits are bought by men who know—men who compare—men who have learned by experience. They will be chosen by you if you make the same careful comparisons.

## Ask for Catalog

Please write us for catalog which contains all the details, and for name of our nearest agent. Please do this now because our output won't last the season through. And because these cars, with top and side curtains, are comfortable summer and winter. Cut out this coupon as a reminder.

*A MEMO TO*
*Chalmers-Detroit Motor Co., Detroit, Mich.*
Please send catalog to

*Name*_____

*Address* _____

*City* _____

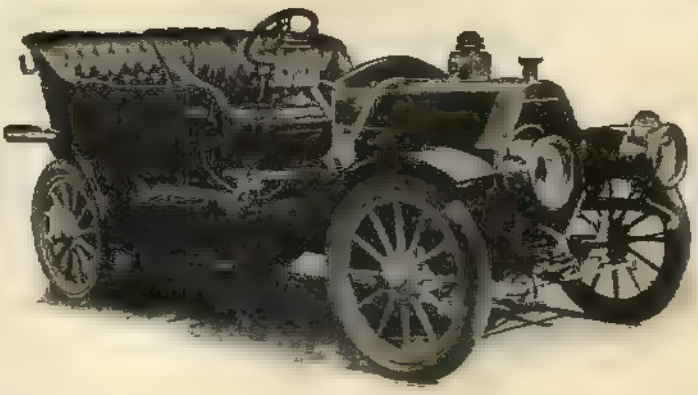
*County* _____ *State* _____

# Detroit, Michigan

*Members Association of Licensed Automobile Manufacturers* (26)

# CAR AHEAD!

Weight 1700 lbs.



30 H.P. (Actual)

## RIDER-LEWIS "FOUR"

### The Biggest Little Car Ever Built

¶ In design, appearance and ability, the Rider-Lewis IV easily heads the list of popular priced cars.

**FEATURES:**

| | |
|---|---|
| Four Cylinders | Flexible Motor Supports |
| Valves in the Head | Rear Axle Gear Set, 3 Speeds |
| Magneto Ignition | Straight Line Drive |
| Thermo-Syphon Cooling | Light Weight |
| 32″ x 3½″ Tires | 100″ Wheel Base |

**Simplicity the Very Keynote of the Design**

**WE ALSO MANUFACTURE THE EXCELLENT SIX**

(The Most Luxurious of Cars), Price. $2500

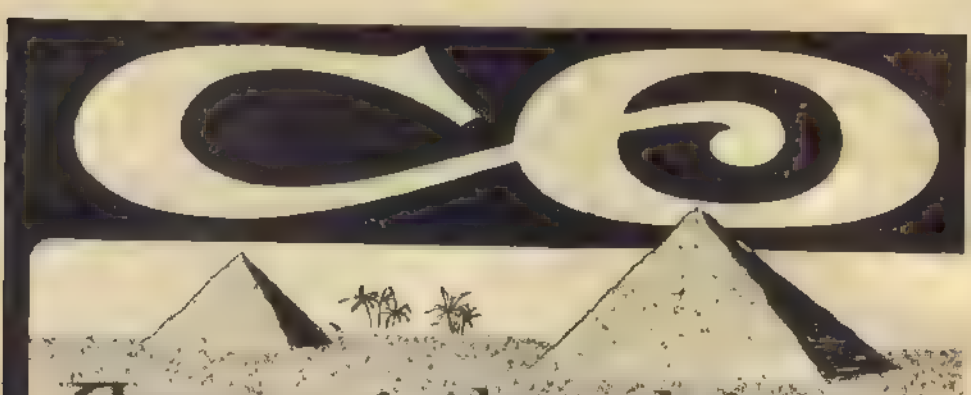
CATALOG ON REQUEST. AGENTS GET OUR PROPOSITION

**Price, $1050** **The Rider-Lewis Motor Car Co.**

(Fully equipped with Remy Magneto and full lamp equipment.)

Anderson, Indiana

Eastern Distributor:—H. J. Koehler Sporting Goods Co., 1709 Broadway, New York City



Among the things that are built to

## THE COES WRENCH

will outwear a dozen ordinary or "Near-Coes" wrenches, because it is built for service. None but the highest grade steel forgings and castings, thoroughly case-hardened, are used; and the sixteen inspections to which each wrench is subjected guarantees you against the slightest imperfection.

# COES

# Last

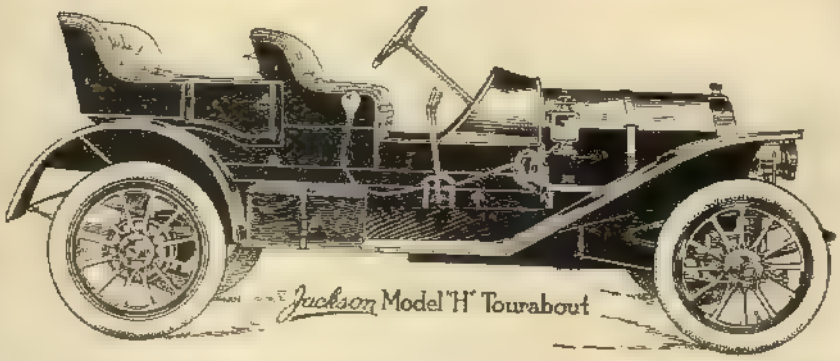
WE have been making and marketing **Coes Wrenches** for 70 years, and their popularity shows no signs of waning. This is because wrench buyers have learned that the **Genuine Coes** is as near perfect as a wrench can be made, and will give a life-time of service. Insist upon having the **Genuine Coes**. Don't accept any substitute and you will avoid much trouble. Each wrench is **warranted free from mechanical defects.**

**COES WRENCH COMPANY**
WORCESTER :: :: MASSACHUSETTS

NEW YORK AGENTS
J. C. McCarty & Co., 21 Murray St., :: New York City
J. H. Graham & Co., 113 Chambers St. New York City

# JACKSON

## Model "H"—$1600




**4 Cylinder, 30 H. P., Bore, 4½"; Stroke, 4½"**

**Tires, 32 x 4. Gas Lamp, Magneto. Furnished with Touring or Tourabout Body**

**MODEL E—$2000.** Touring Car or Tourabout. 4 cylinder, 36-40 H. P., unit power plant, valves inclined in cylinder heads, overhead cam-shaft.

**MODEL C—$1250.** Touring Car. 2 cylinder, 20-24 H. P., chain drive.

**MODEL K—$950.** 4-passenger Touring Car. 2 cylinders under the hood, shaft drive, 15-18 H. P.

**MODEL F—$850.** Runabout. 2 cylinders under the hood, shaft drive, 15-18 H. P.

*WRITE FOR CATALOGUE*

**JACKSON AUTOMOBILE CO.**

**JACKSON, MICH.**

# KILL YOUR WOES

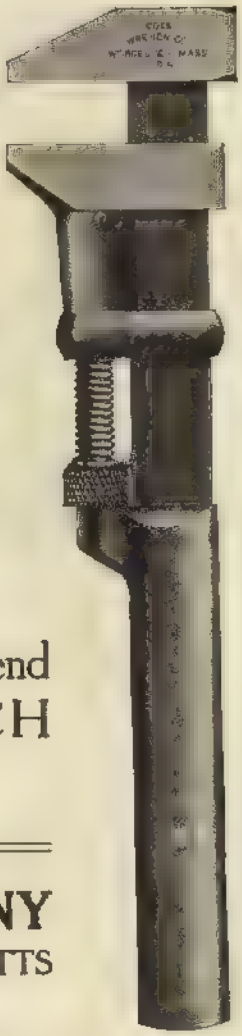
## 23 miles from anywhere, with a breakdown and a busted wrench

Ever have such an experience?

No doubt you have, unless you use only the **COES** for your wrench equipment.

**THE COES the Genuine Coes** is the only wrench that will stand hard usage, because it is the only wrench that is so carefully made. Each Coes is inspected **sixteen times** in the course of manufacture. How could the slightest imperfection creep in under such circumstances?

# AND GET A



¶ Every Coes package bears the STAR ☆ Trademark. None are genuine unless so marked. Don't let the dealer sell you any other. You'll be sorry if you do.

## COES WRENCHES

are made in any number of models to meet all requirements. Send for a copy of our WRENCH BOOK and take your choice

**COES WRENCH COMPANY**

WORCESTER :: MASSACHUSETTS

**NEW YORK AGENTS:**

J. C. McCARTY & CO., 21 Murray Street, New York City
J. H. GRAHAM & CO., 113 Chambers Street, New York City

# Matheson

# Recent Victories

**FIRST AND SECOND** in Washington-Hagerstown 168 Miles Sealed Bonnet Contest, May 15, 1909, winning Washington Post Cup, against a field of **18 CONTESTANTS.**

**PERFECT TIME and ROAD SCORES** in Norristown-Hagerstown 400 Miles Endurance Contest, May 18-19, 1909, against a field of **32 CONTESTANTS.**

**TWO MORE PERFECT SCORES** in New York-Boston Endurance Contest, 247 miles, March 11, 1909, against a field of **20 CONTESTANTS**

**FIRST, SECOND and THIRD TIME PLACES** in Philadelphia-Wilkes-Barre 300 Miles Mid-Winter Contest, against a field of **32 CONTESTANTS,** January 1-2, 1909. Only three of the 32 cars entered had perfect scores and **THOSE THREE WERE MATHESONS.**

**50 H.P. Six-Cylinder Shaft Drive, $3,000**

Equipped with choice of Touring, Tourabout, Toy Tonneau, Close Coupled or Runabout Bodies.

**50 H.P. Four-Cylinder Chain Drive, With Touring Body, $5,000**

**Limousine or Landaulet, $5,750**
**Tourabout or Roadster, 4,750**

**MATHESON AUTOMOBILE COMPANY**
**MAIN SALES OFFICE, 1886-1888 BROADWAY, NEW YORK CITY**
**FACTORY: WILKES-BARRE, PENNSYLVANIA**

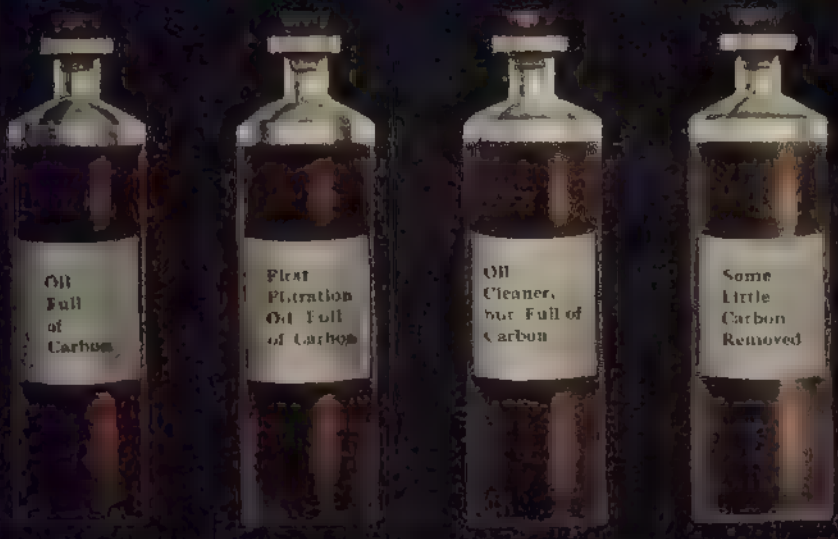
# "HAVOLINE"

CRUDE OIL

VERY POOR OIL

VERY POOR OIL

POOR OIL




¶ A cylinder oil is required to do two things: (1) lubricate, and (2) burn up cleanly, so as to leave no carbon deposit. Any oil will lubricate if it has enough body, but very few will burn up cleanly—they contain too much carbon.

¶ Carbon is removed from oil by filtration, and the more completely an oil has been filtered the cleaner it will burn.

## HAVOLINE OIL COMPANY

EXECUTIVE OFFICES:
75 Broad Street
NEW YORK

HAVOLINE MOTOR OILS

RETAIL STORE:
1906 Broadway
NEW YORK

Red Head
TRADE MARK
is made good
has made good
PORCELAIN OR MICA
ANY THREAD - $1.00
Emil Grossman Company
NEW YORK CITY

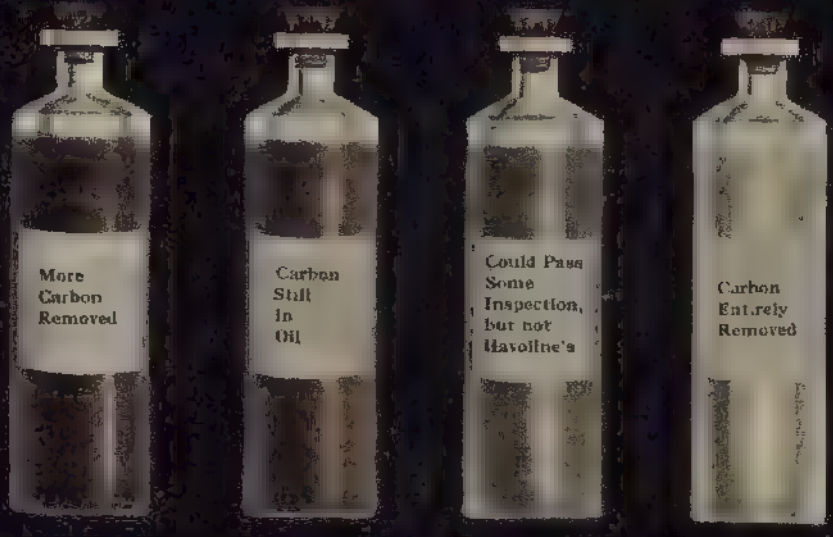
# "HAVOLINE"

FAIR OIL

UNRELIABLE OIL

DOUBTFUL OIL

"HAVOLINE" CRYSTAL OIL




¶ The best oil is simply the one which has body enough to lubricate and has *then* been most completely filtered. ¶ Havoline oils are the only oils made which are completely filtered, and which possess sufficient body and fire test to properly lubricate a gas engine. In proof of this statement we invite a comparison between Havoline and any other brand of oil in existence.

*Write for 1909 Catalogue and Price List*

## HAVOLINE OIL COMPANY

CHICAGO: 40 Dearborn St.
BOSTON: 240 Boylston St.
ST. LOUIS: 4430 Olive St.

HAVOLINE MOTOR OILS

Pacific Coast Agents:
W. F. FULLER & CO.
All Pacific Coast Cities

# Packard OIL

¶ This oil has been selected by the Packard Motor Car Company as being especially adapted to use in Packard Cars.

¶ It is sold exclusively under the trade name "Packard" and is the only oil so endorsed by the Packard Motor Car Company.

¶ Packard Cylinder Oil and other Special Packard Lubricants, such as trans-

## HAVOLINE OIL COMPANY

**On Sale by all Packard Dealers**

HAVOLINE MOTOR OILS

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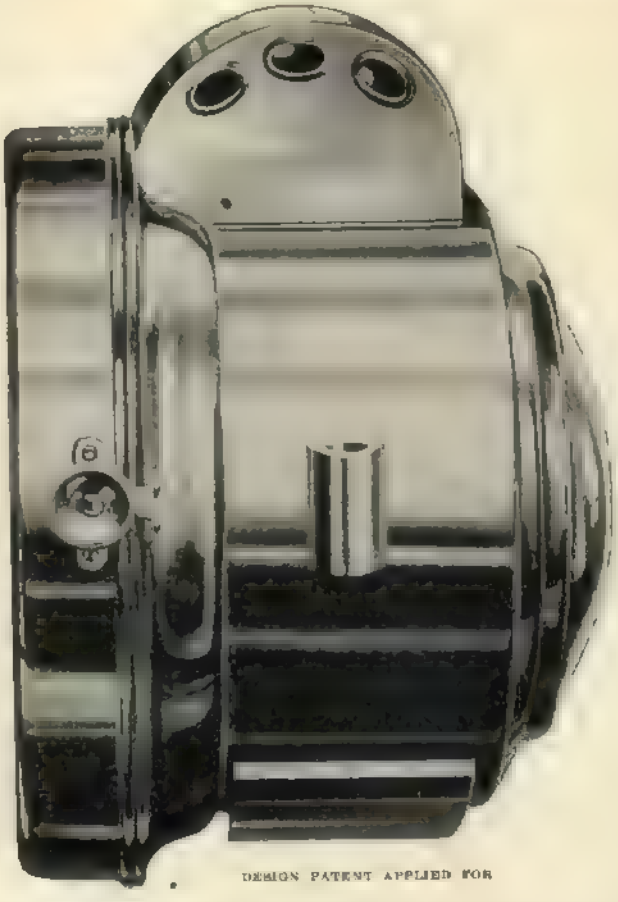
## HAVOLINE OIL COMPANY

**On Sale by all Packard Dealers**

HAVOLINE MOTOR OILS

**On Sale by all Packard Dealers**

# GRAY & DAVIS
# 1910 Close-Coupled Lamp



DESIGN PATENT APPLIED FOR

"JUST AS GOOD AS IT LOOKS"

**Gray & Davis, Amesbury, Mass.**

# Packard OIL

mission oil and grease, now have a wide reputation for excellence and a wide sale.

¶ These oils are valuable stocks for all garages and supply stores. The Packard endorsement and recommendation means that the user is sure of satisfactory results.

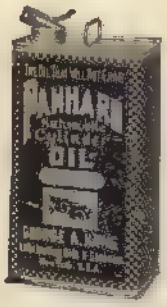
¶ A complete, illustrated price list may be obtained from any dealer handling this oil or directly from us.

## NEW YORK CITY

**Executive Office**
**75 Broad Street**

HAVOLINE MOTOR OILS

**Retail Store**
**1906 Broadway**




THE NEW CAN
—It's Sealed

# PANHARD OIL

"The Oil in the Checker-Board Can"

# OIL TALK

## To the Trade

**SINCERITY OF PURPOSE** is the foundation of business success the confidence that your customers place in your integrity and the knowledge that they get a "square deal" holds your trade—our business is the same.

**IT HAS BEEN OUR AMBITION** to produce the highest grade of Cylinder Oil. To this policy we have rigidly adhered. In the face of the fiercest competition and price-cutting, at the expense of quality, we have maintained the PANHARD standard. It pays to make the best, for during the season of 1909 the sales of PANHARD have almost doubled.

**NOW IS THE TIME TO DECIDE** on your oil for next year If you already handle PANHARD OIL, you know that every customer to whom you sell comes back for more. If you don't, you are losing not only the trade that we make for our dealers by our general advertising, but you are losing out in other lines as well.

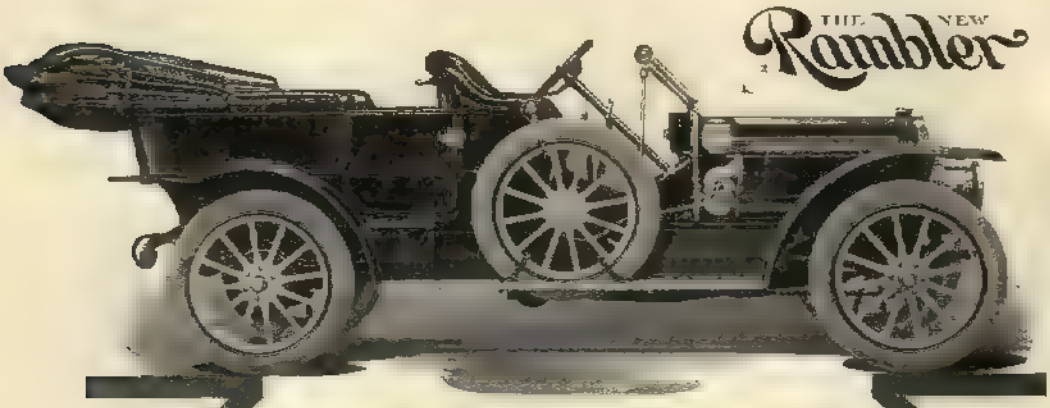
**BECAUSE** every automobilist, even though he may not use PANHARD OIL recognizes its quality. The red checker-board can is as familiar to him as the make of the car he drives. Our sign in your garage or store is an evidence of the high character of all your supplies, and the man to whom you sell PANHARD OIL you will eventually secure as a **permanent customer.**

**WE WILL EXHIBIT AT THE SHOWS** and extend to you a personal invitation to call at our booth at both the Grand Central Palace and Madison Square Garden shows in New York City Let us make our proposition Better still, write for full particulars now

**WE ANNOUNCE TO THE TRADE** that the New York City court has just handed down a decision in our suit against the H. T. Alexander Co., restraining them from using the name of PANHARD as applied to automobile oil, and giving us the exclusive right to same.

**THESE BOOKS WILL HELP YOUR TRADE.** We have just issued a booklet, "LUBRICATION" It will fit your envelopes Our dealers tell us that it has helped them secure more business for PANHARD OIL It will help you. How many can you use?

## GEORGE A. HAWS, 72 PINE STREET NEW YORK CITY




Model Fifty-five, 45 H. P., $2,500, with Magneto, Lamps, Presto Tank and Tools.

THE new Rambler is better than any previous Rambler in quality, dignity, silence and comfort, and in many respects it is superior to any other automobile; built in three models: Fifty-five, seven-passenger, forty-five horsepower, $2,500; Fifty-four, five-passenger, forty-five horsepower, $2,250; and Fifty-three, thirty-four horsepower, $1,800; magnetos included.

Model Fifty-five

Capacity, Seven passenger.
Engine, Four cylinder 6 x 5½.
Wheel base, 128 inches.
Wheels and tires, 36 in. x 4½ in.
Spare wheel, with tire brackets and tools, $10.
Top and Rambler wind-shield, $150.

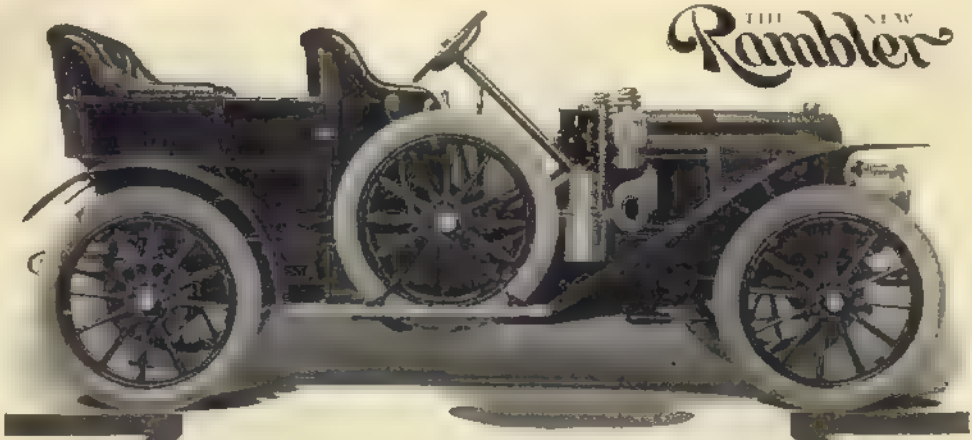
Equipment: Magneto, 6-80 storage battery, two gas head lamps, electric side lamps, combination electric and oil tail lamp, Presto-lite tank, adjustable foot rest and robe rail, horn, gong, and tools.
Color: Light Brewster green, striped pea green, with cream wheels.

## Thomas B. Jeffery & Company

Main Office and Factory, Kenosha, Wis.

Branches and Distributing Agencies:
Chicago, Milwaukee, Boston, Cleveland, San Francisco. Representatives in all leading cities.

THE CAR OF STEADY SERVICE




Model Fifty three, 34 H. P. $1,800, with Magneto, Lamps and Tools.

MODEL Fifty-three, at $1,800, except for improvements, is identical in quality and power with previous Rambler models which sold at $2,250.

Capacity Five-passenger.
Engine Four cylinder, 4-4 x 4¼, thirty-four horsepower.
Wheel-base 108 inches.
Spare wheel, with tire brackets and tools $75.

Wheels and tires 36 in. x 3½ in.
Color Dark Brewster green body with cream wheels.
Equipment Magneto, oil side and tail lamps, gas head lights and gun metal horn, full set of tools and jack.

## Model Fifty-four

Model Fifty-four, forty-five horsepower, at $2,250, except for body capacity, is practically a duplicate of Model Fifty-five.

Capacity Five-passenger.
Engine Four cylinder, 5 x 5½, forty-five horsepower.
Wheel-base: 117 inches.

Wheels and tires 36 in. x 4 in.
Color: Light Brewster green and cream wheels.
Equipment: Same as Model Fifty five.

## Thomas B. Jeffery & Company

Main Office and Factory, Kenosha, Wis.

Branches and Distributing Agencies:
Chicago, Milwaukee, Boston, Cleveland, San Francisco. Representatives in all leading cities.

THE CAR OF STEADY SERVICE

with the additions now under construction bringing the ratio far above that figure. All this has been accomplished without an assessment on the stockholders and in spite of the payments of regular dividends.

But one change has taken place in the personnel of the executive staff since the movement of the plant to Detroit. Mr. Packard in 1909 retired from the office of president and Mr. Joy was elected to this position, Mr. Packard, however, remaining chairman of the executive board. S. D. Waldon who was sales manager of the company when it was at Warren, and who had held that position until 1909, was promoted to the general management of the firm.

Packard Company's Officers.

One cylinder of the new 3000-horsepower compound engine on the Packard plant. Reading from left to right: Chief Engineer Russell Huff; Manufacturing Manager J. J. Mooney; President H. B. Joy, and General Manager S. D. Waldon.

The Packard factory is now the largest single plant devoted to the manufacture of motor cars. Its payroll Oct. 1, included 5,333 men, nearly all of whom are skilled laborers. To an annually increasing degree the Packard has been making its own car, even though the advantages of this plan are less attractive from the standpoint of economy than of certainty of supply. The firm is now constructing an enormous foundry, among its other additions. It expects to pay more for the product of this foundry than it did for the same amount of manufactured material, when bought of another manufacturer. But the management will have the satisfaction of knowing that it will not be at the mercy of any contractor whose delays might hold up the delivery of cars at the date specified. The new foundry is merely a step in the old policy of the firm which started in to do one thing and to do it well.

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# Cadillac Motor Car Company

IN March, 1908, a committee of Royal Automobile Club, appointed for the purpose, stepped into the salesrooms of the London branch of the Cadillac Motor Car Co. and designated from a large stock of cars that had just arrived at the factory, three that were put to a test which has remained to this day the most wonderful achievement of motor-car manufacturing.

The three cars were taken to the famous Brooklands track where they were driven at speed. All three showed within a small decimal of 34 miles an hour and ability to travel at this speed as long as the fuel held out.

In quarters selected for the purpose the three cars were then taken to pieces. Carefully and methodically the work was done until not a bolt remained attached to the nut which had held it in place in the car as a component part of which it had left the factory in Detroit.

When the work was finished, each car had contributed seven hundred and twenty-one separate pieces. The gentlemen in charge of the test then took these 2,163 fragments and placed them in a heap. They were then stirred up until all possible chance of identity was lost. Then, with the only direction a knowledge of where the pieces belonged in the mechanism of the car, but with no means whatever of telling which of the three cars had contained them at the start, the work of assembling began. Without the use of any tool but a wrench, pistons slipped into cylinders and spindles into hubs. What had been merely a collection of junk again grew into three graceful motor cars. The work was finally finished and the fuel and oil tanks filled. While the astounded audience of experts looked on, the engines were turned over and each motor began singing its sweet song. To the Brooklands track, without even an opportunity for tuning up, the cars were taken again.

Over the surface of that famous speedway they were again sent at speed. Watches were snapped on the three as they swept around in column for lap after lap, until each had traveled 500 miles. And the calculation that followed produced

an amazing result. Each of those cars was traveling within a minute decimal of 34 miles an hour.

The wires brought the news of the test to Detroit. The most famous colony of motor experts in the world heard and marveled, as had their brother experts of Europe. But at the Cadillac factory the grim, old tool maker to whom the news was first communicated only smiled and quietly commented that there was no occasion for especial remark. Any Cadillac

The Cadillac Motor Car Co. is the oldest of the Detroit factories. It is an outgrowth of the Detroit Motor Co., organized in 1902, becoming in the following year the Cadillac Automobile Co., under which name it marketed in 1903, 2,000 single-cylinder cars. In 1905 this was changed to the Cadillac Motor Car Co., as the result of a consolidation with the Leland & Faulconer Manufacturing Co., which had formerly constructed the motors for the company, at a different plant.

Cadillac Motor Car Company's Main Factory.

of the 20,000 that have passed out of the doors would have qualified as one of the three. And he ought to know for he is the man who built them.

On November 9, 1909, the veteran H. M Leland will have concluded his semi-centennial as a worker in steels. He says he began his career with a firm to whom the measurements of the micrometer were regarded as little more than coarse. He has been with people even since, whose views have been the same. They are now his own. When, in 1905 Mr. Leland became manager of the Cadillac Motor Car Co., he laid down a hard and fast rule that emery cloth and file should never be used in the assembly room of the Cadillac. A system of accuracy was inaugurated and brought to perfection which has formed the goal of virtually all other manufacturers. The climax, so far as the world was concerned, came in the famous test which was later awarded the Dewar trophy as the most noteworthy accomplishment in the realm of motoring for the year. But Mr. Leland and his compatriots in the Cadillac factory knew in advance what the result of this test must be. The Cadillac models have changed since that time but every performance in standardization, credited to the little single-cylinder car, is within the scope of the "Thirties" which now form the output. At any rate, this is a statement that nobody has even questioned

The firm scored its largest success with its 1909 model, following the advent of which, after several prior proposals had been voted down, the directors decided to accept an offer of the General Motors Co and sold the entire plant, the sum of $4,500,000 being required to swing the deal.

Some idea of the profits of the stockholders may be derived from the knowledge of the fact that, during their connection with the company, they had invested the sum of $523,000, on which dividends to the amount of $752,000 had been paid. All the principal stockholders were Detroiters, the General Motors millions being divided chiefly among H. M. Leland, W. C. Leland, William H. Murphy, Lem. W. Bowen, A. E. F. White and Clarence Black.

The sale has made virtually no change in the policy of the Cadillac. In fact, to the casual observer, there has been no change at all. W. C. Leland has replaced his father as the general manager, H. M. Leland being present in an advisory capacity. The same general staff is in charge and the changes in the roll of employes have been no greater than would normally have been the case, had there been no change in ownership.

Due perhaps to the fact that the Cadillac was one of the largest of the pioneer factories, a large number of expert men in the manufacturing field have been developed by the Cadillac, some of whom are

performing similar duties at other factories. In a way the Cadillac has been probably the most notable incubator of motor car genius, of all the Detroit factories. Time and again other firms have lured away star members of the Cadillac staff but there has been always some one to fill the vacant place and the Cadillac has pursued the even tenor of its way

The Cadillac also operates the old Leland & Faulconer plant on Trombley avenue.

The firm employs 3,400 men, and, in 1909 built in the neighborhood of 6,000 30-horsepower cars. By making use of all possible facilities the firm expects to market 10,000 cars in 1910 and for months the factory has been turning out 36 cars a day. The demand has been, however, far in ex-

The Cadillac Company's Trombley Ave. Plant

The present Cadillac factory is of brick construction, three stories in height and occupies virtually an entire block, bounded by the Michigan Central tracks and Amsterdam, Cass and Second avenues. The company also owns the block between the factory and Woodward avenue and occupies the front portion of this with the local retail branch. The land intervening is occupied by a number of long sheet iron stock rooms, but rumor has it that, in the near future, a four-story factory building will be erected on this property, with overhead communication with the main plant

cess of the factory's capacity and the sales department created one of the sensations of the fall season by cutting off its list nearly half of its distributors of 1909, in the effort to centralize its efforts and provide with cars the main centers of the selling trade.

Though the Cadillac has now centered its entire energies on the production of its 30-horse power model, it is the proudest boast of its selling force that, so far as it has any knowledge, every one of the 20,000 single cylinder cars so prominent in the motoring of recent years, is still in running order and in actual use.

# Regal Motor Car Company

For many years the Clayton & Lambert Manufacturing Co. of Detroit, has manufactured virtually 90 per cent. of the world's output of plumbers' fire pots and torches. When the automobile industry sprang into being in Detroit, their foundry which is equal in capacity to anything west of New York, was heavily drawn on for castings of all sorts by the various manufacturers. These demands, coupled with the firm's big trade in its specialty, kept its force so busy that not until 1907 did the idea occur forcibly to the firm that it might be profitable to them to manufacture cars themselves.

An addition was constructed to the original plant and Earl W. Winans, a competent engineer and designer was placed in charge of this department. The Regal Motor Co. was organized and, in 1907, the firm built and sold 50 cars

Like many another factory that output of the first year did not entirely satisfy the manufacturers of the car. Unlike some other firms, the Regal Motor Car Co., however, did not make use of the money derived from the sale in improvements on the models of the following year. They personally called in every one of those 50 cars at the end of the season and furnished every one of the purchasers with a brand new 1908 model, absolutely free of charge. The 1908 models filled every requirement of the manufacturers and users alike. With this beginning the Regal Motor Car Co. laid down a policy which has been maintained ever since. It takes care of the purchasers of its output. On several occasions it has sent a personal representative with a car to act as demonstrator and to stay on the scene until the novice driver has thoroughly mastered every detail of manage-

ment. In 1908 the firm marketed over 800 cars. This was increased in 1909 to 1,200 There are 2,100 Regals in active use in the United States and the 1910 models are being delivered as rapidly as the railroads can freight them away. The company expects to keep up its 1910 run until 3,000 cars of its 30-horsepower model have been delivered.

Haines, vice-president, Bert Lambert is treasurer and J. E. Lambert, secretary.

Mention of the Regal factory's output and its deeds would be incomplete without recalling the remarkable transcontinental trip made by the "Regal Plugger" in 1909. In this, the first of the 1910 models Geo. D. Wilcox, the Regal distributor in Syracuse, N. Y., Richard N. Byrne, a Syracuse attor-

The New Regal Plant.
Administration building on Piquette Avenue next to Ford. The factory runs back a block to the Belt Line Track.

A fine new factory building has been constructed on Piquette avenue, directly alongside the plant of the Ford Motor Co. and adjoining the Clayton & Lambert plant. A 20 and a 40 horsepower model are now being perfected and the company is planning on manufacturing no less than 11,000 cars in 1911 and is making all necessary preparations for the task.

Virtually to a man the officials of the Regal Motor Car Co. are identical with those of the Clayton & Lambert Manufacturing Co. C. R. Lambert is president, Fred W.

ney, and Driver Wm. Smith from the Regal factory, left New York at noon July 5 and made the trip to San Francisco in 30 days, having covered 4,031.5 miles with the car in as good condition as at the start. The trip was in no sense a speed trial, but was merely made in ordinary touring conditions and at a time of year when the middle western roads were in terrific condition. The trip attracted great attention all along the route and served as a most prominent means of placing the car in its proper light before the public.

# The Hupp Motor Car Company

AWAY back in the days of 1902, when the Olds Motor Works was the only producing Detroit make of motor cars, R. C. Hupp decided to cast his lot with the industry in which he saw a future. As many educated young men in Detroit have done since, he entered the Oldsmobile factory as a common laborer. He was promoted from time to time and, when the factory was moved to Lansing, he was appointed department foreman. Later on he transferred his allegiance to the Ford Motor Co. Hupp studied the science of automobile building and made up his mind to start a factory. He associated himself with E. A. Nelson, then an employee of the Packard factory in the designing department. The two put their heads together and made up their minds to cast their all in the endeavor to interest capital and start a factory. This was in 1908. Mr. Hupp interested J. Walter Drake and John E. Baker in their enterprise. These gentlemen agreed to pay

A unique feature of the Detroit Electric's local life is the continued search of its testers for bad pavements. Unlike their brethren of the gasoline car, the testers of the electrics seek poor roads instead of the asphalt and the glossy macadam. To thoroughly make certain that all the wiring is in place and securely fastened, it is the practice of the testers to search out the roughest possible street and they drive up and down, until absolutely certain that everything is anchored securely

The plant of the Anderson Carriage Co is situated directly across from the station at Milwaukee Junction, on the East Side of Detroit, and commands ideal shipping facilities on the Michigan Central, Lake Shore and Grand Trunk, as well as being situated right in the center of one of the most populous laboring districts of the city.

# Hudson Motor Car Company

More than the usual trade ripple which customarily greets the announcement of the formation of a new automobile manufacturing firm, was noted in Detroit when the first announcement of the Hudson Motor Car Co. was given to the press

J. L. Hudson

in June, 1909. This was largely due to the fact that the firm was composed of men who had already made marked successes in their respective lines of effort J. L. Hudson is the owner of the largest department store in Detroit and is a merchant of national reputation, as well as a noted civic leader in his home city. He is the president of the company and the man from whom the car takes its name The other officers are, with one exception, actively connected with the membership of the Chalmers-Detroit Co., which had just celebrated the year with one of the most noteworthy successes in the history of the industry—the Chalmers-Detroit "Thirty." Hugh Chalmers is the Hudson vice-president; R. B. Jackson is treasurer and general manager; F. O Bezner is secretary, and H. E. Coffin and R. D. Chapin are members of the board of directors. The large interest of the directors in the Chalmers Detroit Co. does not in the least indicate any actual connection between the factory organizations. As a matter of fact, the two are completely separate. Not even in the purchasing departments is there any placing of combination orders while the selling agencies are almost invariably at different locations in the various cities where both are handled. The cars fill an entirely different place in the motoring world, the Hudson being a 20-horse power car and manufactured exclusively as a runabout

Geo W. Dunham, Designer.

The Hudson car itself represents the ideas of George W. Dunham, the chief engineer and designer. Mr. Dunham was

R. B. Jackson, Treasurer and General Manager of the Hudson Motor Car Company.

with the Olds Motor Co. for a number of years, and succeeded Howard Coffin as the chief engineer in 1907, when Mr. Coffin left the Olds to enter the Thomas Detroit. He resigned his position in March, 1909, to complete the work which he had had in process for two years. The work blossomed out as the Hudson Twenty.

The formation of the new organization was followed by the leasing of the old Aerocar plant on Mack avenue, but quarters there are regarded by the company as merely temporary and it is only a matter of time when the factory will make the announcement of a changed location.

The company started work on its 1910 model in July, 1909, and was busily at work in a surprisingly short time. Hudsons have been shipped to all parts of the United States in the six months of their initial year and have scored a pronounced success. Consistency in running is said to be one of the chief assets of the car.

The company will finish its run of 1910 models in July and will then have manufactured 5,000 of them if the well-founded plans of the management are met. The entire output has been sold some time since.

Plant of the Hudson Motor Car Co

# Grabowski Power Wagon Company

"We guarantee Service," is the proud motto of the Grabowski Power Wagon Co., of Detroit, and the fact that the firm's product is in use in the work of many of the city's large mercantile establishments and that the firm's factory is now engaged on a regular campaign of producing eight trucks per week goes to prove that there are a lot of satisfied customers in Detroit, as well as elsewhere in the scope of the firm's selling agents.

While other engineers were at work designing touring cars and runabouts in the early history of the motor manufacturing industry, Max Grabowski was working on a power wagon. He built one in the early nineties. He kept adding improvements and, when he was ready, began the active manufacture of his model

Mr. Grabowski's success resulted in the purchase of a large and commodious factory in Pontiac and the firm was re-or

ganized as the Rapid Motor Vehicle Co., which was later purchased by the General Motors, and is still being actively operated

In August, 1907, Mr. Grabowski resigned his position with the Rapid and returned to Detroit, where, after incorporating his latest ideas in a model truck, he organized the company that now bears his name Associated with him in the firm are Bernard Gensburg, vice-president; Adolph Finsterwald, treasurer, and John Baker, Jr., treasurer.

The Grabowski factory on Champlain street has been outgrown in the second year of the factory's history and negotiations are now in progress for the purchase of a plot of land on which the firm will erect a factory with a capacity of 1,200 trucks annually

# The Herreshoff Motor Company

The Herreshoff Motor Company was organized in September, 1908, to build automobiles and immediately began operations at its present location on Harper Avenue and Dequindre Street, Detroit, Mich.

word being "Quality rather than quantity."

When the factory is in full operation about 100 men are employed in the various departments, but much of the work of making up the component parts is done

Herreshoff Motor Company Plant.

Charles F. Herreshoff, who is well known as an engineer and naval architect is now president and acting head of the concern

The chief aim of this company is the production of a small, high class automobile of the best quality, intended for those who appreciate beauty and refinement in design rather than greater size with crudeness. The output is limited, the watchoutside of the plant by parts specialists who work to designs furnished by the Herreshoff Motor Company.

The 1910 product now coming through the factory will be distributed direct to agents instead of through an outside selling agency as was done with the 1909 production, this plan being adopted as being more satisfactory to the customer.

# The Krit Motor Car Company

Among the newcomers and builders of medium priced high grade machines, are The Krit Motor Car Company. This concern was organized September 3, 1909 Mr C. S. Briggs, President; Wm. S. Piggins, vice-president, and B. C Laughlin, secretary and treas. The car is of runabout type, although arrangements are made for seating four passengers. It is a natty looking little machine and was designed by Kenneth Crittenden, who has been connected with the industry for some years, both with the Ford and the Regal. The first car was placed on the road October 30th, and has been thoroughly tried out Deliveries are now being made and it is expected that 1,000 machines will be completed before the end of the season, parts having been secured for this output.

The car has a 96-inch wheel base, and extremely compact four cylinder motor cylinders cast "en bloc," bore, 3¾ inches, stroke, 4 inches, sliding gear transmission, 32x3 inch tires, and Bosch magneto. The runabout sells for $800, the roadster, $825, and the four passenger car, $850

## Warren Motor Car Company

The Warren Motor Car Co., of Detroit, one of the latest additions to Detroit's automobile companies, capital stock $100,000, all of which has been subscribed and paid in, is now in its new plant, corner of Isabella and Michigan avenues, Detroit. The car is to be called the Warren-Detroit, is of 4-cylinder "en-bloc" type and will sell at $1,100 f. o. b. Detroit.

Homer Warren, Postmaster of Detroit, who heads the organization, is known from one end of the country to the other by reason of his prominence in Detroit's real estate and manufacturing affairs. Mr. Warren is a business man of the aggressive type, who does things. With him is associated C. Haynes Wilson, of the Wilson Body Co., who, while not active in the affairs of the company, will give it the benefit of his extensive experience. Harry M Snyder, a director, well-known in automobile circles, is the man who induced the Michelin people to open a factory in America; John G. Bayerline, vice-president and general manager, has been in the automobile business for the past ten years. He was with the original Pope-Hartford Co.; later with the Olds Motor Works in the Engineering Department, and for three years was purchasing agent. When the Hudson Motor Car Co. was organized, he took charge of their purchasing department. R. W. Allen, secretary, was with the Olds Motor Works for six years; later with the Hudson Motor Car Co.

The list of stock holders also shows a number of well-known motor parts manufacturers. The company will build 500 cars, all of which will be delivered before July 1, 1910. Double contracts have been made for all parts and deliveries guaranteed under penalty.

## Detroit-Dearborn Motor Car Company

The Detroit-Dearborn Motor Car Company was organized in Detroit, Michigan, this past summer to build medium touring cars and runabouts. The first cars were on the road November 15. The price which is not definitely settled as yet will be somewhere between $1,400 and $1,800.

The president of the company is Mr. Edward Bland, vice-president, Mr. Arthur E. Kiefer; treasurer, Mr. Samuel D. Lapham. They have secured a lease on a building in the village of Dearborn located four miles from the Detroit city limits out Michigan avenue and have acquired 71 building lots in the heart of that village on which erection of a factory will shortly be started. The company is incorporated under the laws of the state of Michigan for $50,000 and no allowances in the incorporation has been made for patents, tools, designs, or specifications.

## The Cartercar Company

The Cartercar Co. is one of the automobile concerns which decided to move beyond the limits of the City of Detroit a short time ago. The factory is now located twenty-five miles out Woodward avenue, in the outskirts of Pontiac. There are four separate buildings of the factory, all of which are connected affording over five acres of floor space for the manufacture of automobiles.

The officers of the company are Frank T. Caughey, president; A. G. North, vice-president; Harry R. Radford, secretary; H. G. Hamilton, treasurer; R. A. Palmer, general manager.

## Demotcar Company

More than a year ago a coterie of men, most of them experienced manufacturers and well familiar with the automobile trade, informally organized a firm which has recently blossomed out as the Demotcar Co., an organization which promises to cut a very important figure in the local manufacturing field, in view of its backing, the careful manner in which its development work was handled, and the fact that plans have been definitely laid to market no less than 3,000 cars during the season of 1909.

The men back of the Demotcar are C H. Ritter, a wealthy retired business man who is president; George Anthony of the American Radiator Co., vice president; Frank T. Lodge, a prominent local attorney who is treasurer, and William Elsey, the man chosen secretary.

The Demotcar Co. had a thoroughly tested model in use and $100,000 in captial stock, all subscribed, at the time its formal announcement was made to the trade early in the fall. Factory Manager George T. Homeier and Chief Engineer Guy Hamilton, both men with prior experience in automobile manufacturing, were then in charge of the installation of the machinery in the new plant. The first models of the regular season's output are now coming through the factory.

The Demotcar—the name is an abbreviation of the "Detroit Motor Car"—is a light, two-passenger runabout which is noticeably different from any other factory's output

The Demotcar Co. has already arranged its sales department under a separate head in an office down town and is at present engaged in transferring the scene of its manufacturing activities from the outgrown structure which it has occupied during the last few months on Twenty-first Street, to the plant formerly occupied by the Sun Stove Co., at 1305 Bellevue Avenue, near one of the centers of motor car manufacturing. The new plant contains 40,000 feet of floor space and will permit the company greatly improved facilities for handling the work of production.

# 1910 Correja Car

Vandewater & Co., makers of the Correja car, have just moved into their new factory, 71-79 Pierce street, Elizabeth, N. J., where with improved equipment and much larger quarters, they are turning out the first of the 1910 models.

The Correja car for 1910 is a large high-powered, substantially built machine, the makers believing that there has been too strong a tendency towards very light weight machines. Although they are fitted with 4-cylinder, 50 H. P. engines with a bore of 4¾ inches and a 5½-inch stroke, all the models, including the touring car, run about, and baby tonneau, sell for the po, u lar price of $2200

THE BODIES

The bodies are of wood finished in dark green and the running gears in red and the upholstery is of red or black as desired. The rear seats are very wide, admittance being had by a 20-inch door which swings to the rear. A large carrying space under the rear seat, is fitted with a door in the heel boards and on the close coupled body a substantial trunk rack is supplied at the back, as a part of the regular equipment. The runabout can be had with either single or double rumble seats. All bodies are well braced with iron straps and are ironed for tors A 15-gallon galvanized gasoline tank, placed under the front seats, supplies the Stromberg 1½-inch carburetor by gravity feed. The dashes are of straight type built up of laminated mahogany, brass edged.

The wheels are 36 inches in diameter of second growth hickory and are mounted on ball bearings of annular type, made by the Standard Roller Bearing Co.

THE MOTORS

The motors are the same in all models, are of the 4 cylinder type with cylinders cast in pairs with tapered integral water jackets and expansion heads to prevent damage by freezing. The cylinders are 4¾ by 5½ and the valves are 2½ inches in diameter, and arranged on opposite sides and operated by the usual type of coiled spring. The valve lifting rods operate in long valve guides, cap screwed to the crank case. The valve stems are also unusually long and slide in guides, the center portion of which are milled out leaving the ends only, touching the stem thus guiding the valves accurately to their seats, yet without excessive friction. The cam shafts are one inch in diameter, of high carbon steel with cams keyed and pinned in position. The half time gears are held by Woodruff keys. These cam shafts are mounted in three long bronze sleeve bearings, the entire shaft being removable through the front of the case. The cylinders are finished by grinding as are all the bearing surfaces of the motor. The water jackets are tapered, containing a larger volume of water at the top around the cylinder heads in order to maintain a uniform temperature. The connecting rod big ends are 3½ inches wide by 2 inches diameter, and consist of Parson's white bronze boxes, split and held by two through bolts with castellated nuts. The crank shaft is 2 inches diameter, of high carbon steel dropped forged, is hollow, and carries an integral flange at the rear, to which the 90-pound fly

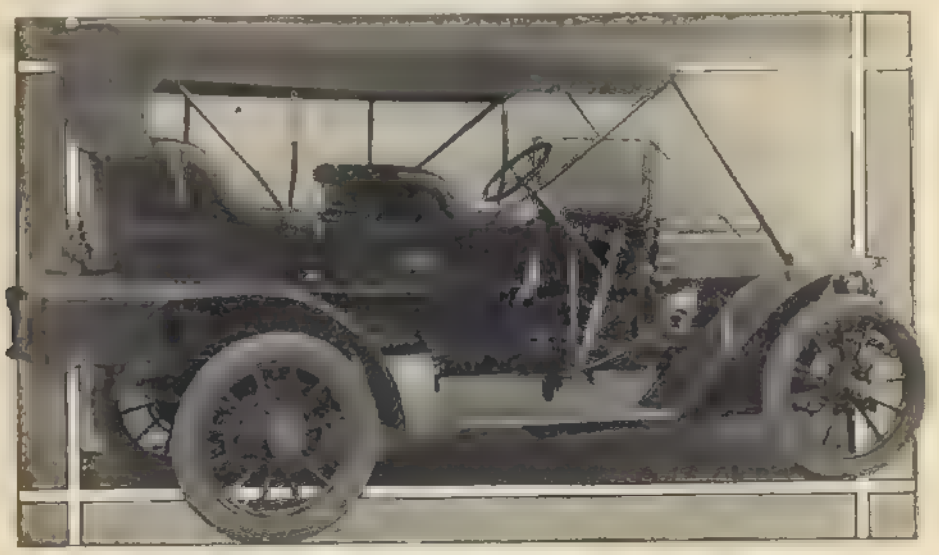

Fig. 1.—1910 Correja car which, equipped with Touring Car type, motor 4 cylinders, 4¾ by 5½ in. 50 H. P. Transmission rear axle of full floating type, sliding three speeds forward and reverse, 36 in. wheels with 4 in. tires, annular ball bearings used throughout. For equipment see text

The Great Western 30 has a big reserve of power.

It takes you anywhere a car can be driven—uncomplainingly.

It will pull you over the worst roads and up the worst hills. It makes child's play of ruts, sand, clay, mud and gravel, that stall most cars.

**Reserve Power**

It's a car of consistent performance—not sometimes—always.

It's the car that "never lays down."

The dependable, every day, all the year around car, and fully guaranteed.

If you're running a Great Western 30 you're at perfect ease.

Your mind and nerves are at rest, because you know it has a reserve strength of construction and motor force that will safely meet any emergency.

**Emergency Strength**

The engine develops a tremendous driving force—more actual power, in fact, than any other motor of equal rated horse power in existence.

It's amazingly economical, and so easily controlled a child can drive it.

It runs as steady, true and certain as a high-grade watch.

# IT NEVER LAYS DOWN

# Great Western

## $1600

The Great Western 30 is the lightest practical automobile ever built, yet it's the strongest. With the exception of cylinders, pistons, fly-wheels, and exhaust manifold, there isn't an ounce of cast iron in its construction.

**Minimum Weight**

Everything else is made of the finest, most durable, strongest and highest priced aluminum, steels and bronzes produced in the world.

That's why it's the lightest and strongest car ever built. That's why it's such an economical, record-breaking car in both operation and up-keep.

One ride in a Great Western 30 car and you'll join the ranks of Great Western enthusiasts.

It runs as silent and swift as the sun light. It's a roomy, luxuriant, handsome, stylish car.

It responds to every demand in a city's congested streets.

**Absolute Comfort**

It holds its own on the boulevards. It's a touring car par excellence. It's swift, strong, powerful and comfortable—the best car of equal horse power any amount of money can buy.

Write us for open territory. It's limited. This one advertisement may close it out. But write us and we'll get together in a mutually profitable manner. Send to-day for illustrated catalog and minutely detailed specifications.

**The Great Western Automobile Co.**
**Peru, Indiana.**

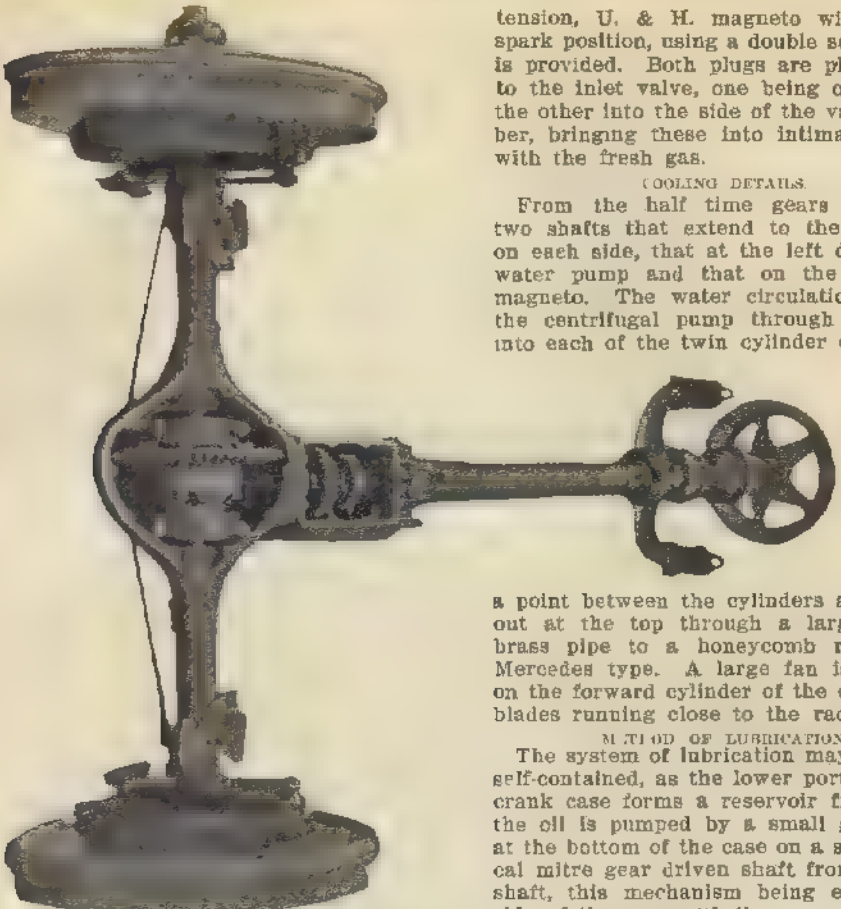

Fig. [illegible] rear axle of the 1910 Correja showing the [illegible] universal joint, the [illegible] carries the forward end [illegible] propeller [illegible] and [illegible] thrust [illegible] the bevel gears [illegible] and bevel gears. Attention is called to the accessibility of these parts. The brakes are unusually large. Raybestos faced and act on separate drums with a half inch cooling space between them. This axle is of the full floating type, the wheels being clutch driven

wheel is mounted by eight through bolts. Cylinders are held by four studs from the case, these studs being of the modern type which are really bolts as each is provided with a nut on the bottom and a castellated nut on the top.

The crank case construction follows approved practice, being cast in two parts of aluminum, the lower half being simply an oil pan while the upper half carries the main bearings supported by through bolts. Four very massive box type integral arms extend from the front and rear of each side of this case and support the motor upon the frame

The motor has a very free exhaust through a large cast manifold of gray iron which has an easy 45 degree curve which connects to a large Gray Hawley muffler which is too well known to our readers to require a description.

A dual ignition system, consisting of a coil, distributor and dry cells and a high tension, U. & H. magneto with a fixed spark position, using a double set of plugs, is provided. Both plugs are placed close to the inlet valve, one being over it and the other into the side of the valve chamber, bringing these into intimate contact with the fresh gas.

COOLING DETAILS.

From the half time gears there are two shafts that extend to the rear, one on each side, that at the left driving the water pump and that on the right the magneto. The water circulation is from the centrifugal pump through a T pipe into each of the twin cylinder castings at a point between the cylinders and passes out at the top through a large tapered brass pipe to a honeycomb radiator of Mercedes type. A large fan is mounted on the forward cylinder of the engine, the blades running close to the radiator.

METHOD OF LUBRICATION

The system of lubrication may be called self-contained, as the lower portion of the crank case forms a reservoir from which the oil is pumped by a small gear pump at the bottom of the case on a short vertical mitre gear driven shaft from the cam shaft, this mechanism being entirely inside of the case with the exception of the pump. The oil is forced to each of the main bearings through copper tubes and finds its way through the hollow shaft to the crank pin bearings. The overflow forms a mist and supplies a shallow oil pool at the bottom, the height of which is maintained by suitable stand pipes. The surplus oil overflowing through a strainer finds its way back to the tank at the bottom. This oil tank is fitted with removable plugs at each end so that it can be readily cleaned when necessary. The wrist pins are hollow steel, the ends being open, thus receiving oil from the cylinder walls.

CLUTCH

After considerable experimenting, the makers of the Correja car have adopted a 14-inch diameter, 12½ degree, 3-inch face, leather covered, aluminum clutch fitted with six easy engagement rings. This is supported and centered on a long 4-inch Parsons bronze bearing lubricated by oil from the inside of the crank shaft. A clutch spring of the usual helical type, is encased in a housing, and the whole being packed and operating in grease. The rear of this housing forms an integral flange, to which is bolted a double

Spicer universal joint with the slip portion at the middle instead of at the end as in last year's model. The drive from this point through the transmission rear axle is by a 1½-inch chrome nickel steel shaft enclosed in a 2½-inch diameter steel housing rigidly connected to the gear housing of a Standard Roller Bearing Co.'s rear axle. This gear case is a steel casting integral with the differential housing. The rear axle tube housings are of 3 inch steel tube brazed and riveted to the central differential housing.

This change speed rear axle gives three speeds forward and a reverse with selective control by the usual side lever which is placed on the right side of the car. All the gears are chrome nickel steel of wide face and liberal pitch and the sliding members are carried on the main or line shaft which is at the top of the case and has milled into it integral spines. The lay shaft is beneath and both are mounted on annular ball bearings of large size. The bevel pinion and its shaft are milled from one piece of steel and provided with a ball thrust bearing, the bearing inside of the driving shaft at the forward end is a tapered roller bearing. On each side of the differential is a large annular ball bearing provided with a special adjusting device consisting of an eccentric ring with a notched or castellated periphery into which a spring pawl fits, thus locking the adjustment beyond any chance of being shaken loose. A pressure of the thumb releases the pawl when it is desired to adjust the bearing. The upper part of the differential housing can be taken off, exposing all the parts and also permitting of their ready removal. This entire rear axle housing is oil tight as there is no parting line except at the cover. The reduction on the direct drive is by a 17-tooth pinion and a 51 tooth bevel gear, giving three to one. The wheels are driven by jaw clutches on the floating shafts by engagement with similar clutches on the wheel hubs, the axle being of the full floating type.

BRAKES.

Unusually large brakes which are 15 inches in diameter, are supplied on separate drums on the rear wheels, these drums being spaced ½ inch apart to allow their properly cooling when for any reason, such as touring in a mountainous country, a long application of the brakes is necessary. The outside brakes are of the contracting double acting band type lined with Raybestos and held positively out of contact when disengaged by two springs, one on each side, attached to brackets fitted to the dust shield which protects the inside brake. The internal expanding brake is the one controlled by the right pedal, and although one inch smaller in diameter than the outer brake, is still 14-inch by 3-inch face. Both brakes are independent of the clutch.

Spring seats are clamped to the rear tube housing. The brake operating rods are all direct pull rods of steel fitted with turn buckle adjustments and single tree type equalizers the full width of the frame.

The gear shift lever operates in a quadrant having two slots and is pivoted at the bottom, its inward or outward motion picking up short levers which control the gear shifting rods in a well known manner. The position of the gears themselves is locked at the transmission case by spring pressed pawls. A separate double plunger between the two gear shifting rods positively locks the idle gears in neutral position.

The front axle is an I section drop forging with integral spring seats and is dropped at the middle about two inches. The steering pivots are mounted on steel bushings at their lower ends and are fitted with a 1-inch diameter hardened steel ball at the upper end. The cross connecting link or yoke ends and the drag link connecting with the steering knuckle arm are of tubular type fitted with adjustable ball and socket shock absorbing ends. The steering gear is a special Gemmer which is of the worm and worm wheel type strongly supported to the frame. The latter is of pressed steel with four channel section cross frame members.

CONTROL.

A 16-inch diameter mahogany rimmed wheel with brass spider is mounted on the top of the steering column and carries on a stationary sector, the spark and throttle control levers. One turn of the wheel gives the front wheels motion through 65 degrees or from extreme position to extreme position.

All springs are of Swedish analysis steel of semi-elliptic type, rear 48 by ½ inches, having 8 leaves and the front 38 by 2 inches with 6 leaves. The rear springs are shackled at both ends giving them entire freedom of movement as they are not required to transmit to the frame the propulsive effort of the rear wheels, this thrust being taken by the propeller shaft housing, the forward end of which is pivoted on a plain bearing in a U-shaped heavy steel casting which is trunnioned to the middle cross frame member, thus giving the rear transmission rear axle a universal mounting to the frame at this point All spring eyes and, in fact, other parts where even oscillatory motion takes place are fitted with grease cups. The spring supporting brackets carried by the main frame are special steel castings, to which the rear springs are shackled at both ends and the front springs at their rear ends.

The running boards are covered with thick cork linoleum, brass bound and webbed to the frame by splash shields. Metal mud guards also fitted with splash aprons are used, each held by two braces to the frame side members

# The DeShaw Two-Cycle Motor Car

In the suburbs of Brooklyn, N. Y., in a modest factory, is being built a very interesting example of what can be done with the modern two-cycle engine as applied to motor car propulsion. We refer to the DeShaw two-cycle car, built by the DeShaw Motor Co., 50 Summerfield street, Evergreen, L. I. This firm has carried on two-cycle experiments for several years until the present four-cylinder, two-cycle motor, which weighs complete but 250 pounds and develops on the brake 28 H. P., is the result. A three-cylinder motor is also made. The idea for these two cycle engines was originated and perfected by Chas DeShaw, the designer and engineer of the company. One of the features which is prominent in this motor is its simplicity. All cam shafts, gears and all valve operating mechanism are of course absent. The officers of the company are: P. H. Clark, president; W. E. Vogt, vice-president; S. W. Bates, treasurer; and E W. Lester, secretary, and Chas. DeShaw, mechanical engineer and superintendent.

The motor is air cooled, no trouble whatever being experienced, it is claimed, in cooling these two-cycle cylinders, in fact, models have been run for a considerable period without any fan without sufficiently overheating to get a preignition. However, a fan of the ordinary type V belt driven from an aluminum pulley on the engine shaft, is supplied and the flywheel spokes also form fan blades, thus giving the motor ample protection against abuse by overheating in the hands of inexperienced operators. The motor is of the three port type with screens fitted into the bypass chambers which latter are made an integral part of the cylinders. Expansion or cover plates are fitted at the top. The actual screen is placed between thin plates drilled with a large number of holes to give sufficient area but still have a body of metal large enough to effectually prevent the screen from ever becoming heated, thus it is impossible for the motor to back fire. The cylinders are cast separately with very deep integral flanges which are quite thick at their outer edges, giving a large radiating surface. Around the top of the cylinder, these flanges are much deeper than at the bottom. The fan is mounted on a stud screwed into a boss on the forward cylinder.

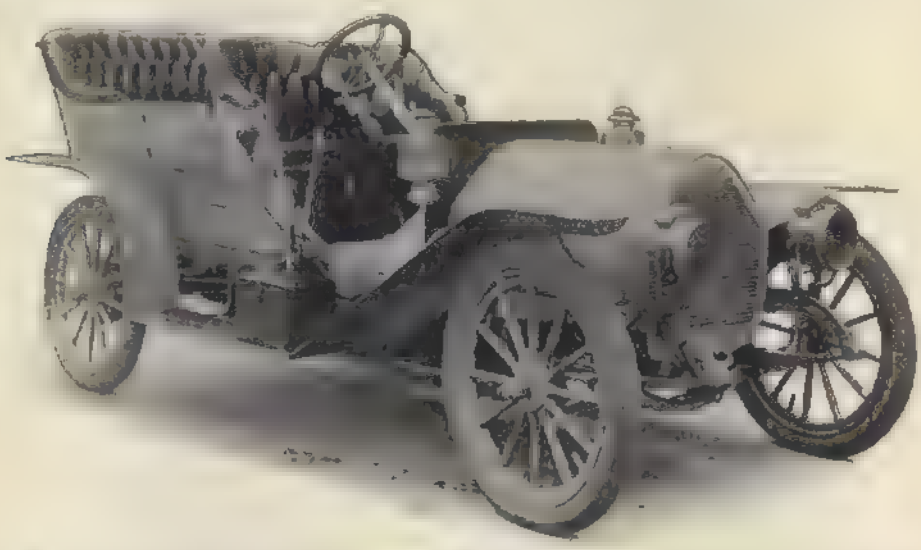

Fig. 1. View of the DeShaw two cycle four-cylinder 28 H. P. touring car which shows the shutter like front to the hood corresponding to the radiator or water jacket cover on the front having taken the place of the [illegible] stroke of 3½ in. and at 1200 revolutions develops 28 H. P. The piston baffle plate is hollow and [illegible] with the cylinder. A special oiling system is used and [illegible] are described in the text. Touring car $2,250. Runabout $1,750.

The bore is 3⅝-in. and the stroke 3½ in. and at 1,200 revolutions a brake horse power of 28 is developed. The exhaust manifold is a one piece iron casting with arms or branches to each cylinder, these being about 8 in. in length, thus carrying the heat away from the cylinder heads. To assist in cooling the hood is closed except at the front where it is built in the form of a window shutter having horizontal transverse slats which allow the air to freely pass but effectually hide any view of the interior. The inlet manifold is also a one piece casting of aluminum, being a U at each end of which is another U the ends of which each supply a cylinder or

rather supply the third port to the crank case of each of the cylinders.

The crank case is a two piece aluminum casting of interesting design, the lower half forming a web extending to the sub-frame side members, completely protecting the underside of the car, this, however, not being as essential in this case as it would be with a four-cycle engine as there are no gears, springs or valve lifting rods to protect. The interior of each crank compartment is extremely small, giving only sufficient clearance for the I section special bronze connecting rods to swing. No nuts are used on the ends of the connecting rod caps to further reduce the size of the rod end, the caps being held each by two 7-16 in. fillister head cap screws which pass through the caps and are threaded into the rod itself and are prevented from loosening by a small curved piece of steel, the ends of which fit into slots in the screw heads and which is retained in position by a small screw in the cap. The pistons are comparatively long being 4⅝-in., the baffle plate is a hollow integral projection on the cylinder head and is opened to the cool gases of the crank case. This baffle plate is ⅞-in. in height. This plate is straight for two-thirds of its length, curving to its cylinder walls at the end and is set about its own height from the cylinder wall. There are four ⅜-in. eccentric diagonally cut rings, three at the top and one at the bottom. These rings are of course pinned in order to pass the ports. There seems to be no peculiarity in the port openings or arrangement, the results obtained being due to their being suitably placed for the particular engine in question. Each port has a vertical flat bridge at its centre.

At the bottom of each of the crank case pits, a small removable plate is fitted giving access to the connecting rod ends when desired.

The wrist pin is a hardened steel tube 15-16-in. diameter, prevented from side slip by a tight fitting split pin passed through the piston boss and into the inside of the hollow pin where the ends are spread.

In the cylinder head is a brass screw cap tapped to receive at the centre a spark plug and at one side a priming cup. This brings the spark plug directly over the centre of the cylinder, the bypass screen is of rather course make so that the area is not too much cut down and so that it will not readily clog, no trouble, it is claimed, has ever been experienced from this source since the large mesh was used.

A crank case pressure of 6½ pounds gauge, engine turned over by hand, is obtained. The cylinders are held to the webbed aluminum crank case, each by four studs and the engine itself is mounted upon the sub-frame by four channel section integral aluminum arms from the upper portion of the case. The crank shaft is a carbon steel drop forging, mounted in 3⅞ by 1⅞-in. Hewitt babbit bearings there being five of these long bearings in all, making each crank case compartment entirely separate.

### THE OILING SYSTEM

The method of lubricating a two-cycle engine is one of the problems of the designer, it being admitted that the ordinary splash system is not as desirable as in the four-cycle type. The method of lubrication adopted for the DeShaw motor is simple yet effective and consists in using a Makenzie six lead force feed oiler placed at the forepart of the motor and belt driven from the engine shaft. Five leads are carried to the five main bearings to a reservoir under the lower half of each bearing. This underfeed system having the advantage that after the motor is stopped the oil does not continue to flow over into the case thus causing smoking from excess of oil when the engine is again started. The sixth lead feeds directly into the intake pipe between the carburetor and the engine, the oil is thus carried with the mixture in sufficient quantities to take care of the pistons and the entire inside of the case always has sufficient oil mist to take care of the connecting rods. A very small amount of oil is usually found standing at the bottom of the case.

### SPECIAL CLUTCH

A specially designed clutch of the internal expanding type has been designed and tested and is now used regularly in the DeShaw models, this clutch consists essentially of a bronze expanding band, 6½-in. dia. and 4-in face, which expands against the inside of the flywheel hub and is carried by a cage consisting of two plates of McAdamite metal which are held together by through bolts. In the surface of the expanding band are three series of ⅛-in. oil holes connected by a shallow groove which allows the oil from the interior of the clutch to find its way between the acting metal surfaces. The clutch is mounted, or centered, on a bearing on an extension of the crank shaft and the expanding band acts against the inside surface of the enlarged hollow hub of the flywheel so that the metal surfaces are bronze against steel. The forward end of the transmission shaft is enlarged and milled to form lugs which grip similar lugs on a steel plate, bolted to the rear McAdamite metal casting, which forms one side of the cage enclosing the expanding band. The oil holes in the band are so arranged that the oil is continually carried to the back of the clutch, keeping the face of it clean. This clutch is expanded by a rotary piece notched to engage one end of the band, this piece has an arm the end of which is fitted with a hardened steel roller which rides upon an incline on a cone which slides on a spline on the clutch shaft, this cone is moved toward or away from the clutch,

thus expanding or contracting the band. It is actuated by means of the usual yoke on a transverse shaft under the control of the clutch pedal. The ends of the yoke arms are also provided with hardened steel rollers to prevent wear at this point. This pedal operates the clutch alone and is not in any way interconnected with the brakes. It is claimed that the clutch is capable of transmitting 60 H. P. The flywheel is of cast iron, weighs about 74 pounds, is 17-in. in dia. and 3½ face and has six fan blade spokes cast integrally. The clutch will hold about a wine glass full of oil which can be introduced through holes provided for the purpose.

milled in the end of the cross shaft which meshes with corrugations on the inside of an eye cut in the rod, tube being held as usual with a taper by means of a lock nut The lever when swung inward, that is, toward the driver and pulled to the rear, gives the low speed and when pushed forward and a latch released by a slight downward pressure on a finger rest, gives the reverse. In the outward ahead position second speed is obtained and when the lever is pulled to the rear it engages the high speed by means of lug clutches. The gear ratio on the high is of course 1 to 1, for the intermediate 1 to 5, the low 3.36 to 1, reverse 4.32 to 1 and the reduction

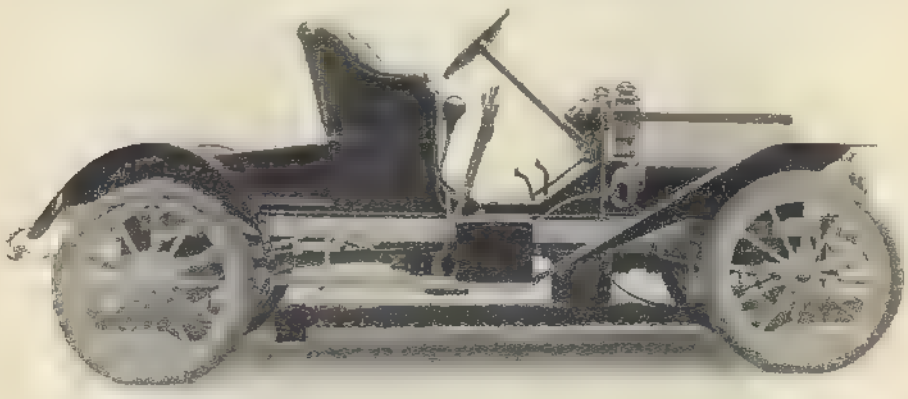

Fig. 2. Deshaw Runabout fitted with two-cycle engine This little car has a 4 cylinder 2 cycle engine of 28 H P which is air cooled A special expanding band metal to metal clutch is used and the change speed mechanism is of sliding gear type giving three speeds forward and one reverse Drive is by enclosed Cardan shaft to the bevel gear rear axle

Between the clutch and the transmission is a short removable clutch shaft, the forward end of which engages lugs at the rear end of the transmission as mentioned, and the rear end of this shaft engages lugs on the transmission line shaft. The piece at the rear end can be slid forward on its rear shaft by releasing a locking collar which makes it possible to remove the short shaft so that the clutch and transmission can be taken out, without interfering with any other parts of the car.

CHANGE SPEED GEAR

The change speed gears which allow three speeds forward and one reverse are housed in a very compact one piece aluminum case supported on the sub-frame by four integral channel section arms, the entire top of the case being removable for inspection, cleaning and oil renewal. This case is 8 in. long by 8½-in. wide. The lay shaft is below the line shaft. All gears are of open hearth steel, pack hardened. The gear operation is by a swinging side lever, giving selective control. The levers controlling the sliding gear members are all contained within the change speed gear case so that there is no chance for an oil leak. The gear shifting arm inside the case is mounted on a corrugated taper

at the rear bevel is 3 to 1. The gear shafts are all mounted on annular ball bearings and the entire mechanism is very rigid in construction, the gears having ample widths.

At the rear of the central cross frame member, a yoke which supports in a pivot bearing the forward end of the propellor shaft housing, is attached, the ends of the yoke arms being pivotally mounted on pins through eye pieces attached to the frame so that the rear axle can have all freedom for up and down motion due to the spring action. The axle can also shift one wheel higher than the other, as the propeller shaft housing is revolubly mounted at its forward end in the yoke, thus giving the combination a universal action. The forward end of the propeller shaft itself is squared to take one-half of the universal joint which is placed between it and the rear of the change speed gears.

The rear springs are three quarter elliptics, shackled at their forward ends to special steel castings riveted to the side frame members. The front springs are of the usual semi-elliptic pattern, fastened at the forward ends to spring eyes in the horns of the frame, special cast steel fittings forming the ends of the side frame members.

BRAKES.

Two sets of brakes are supplied, the emergency brake being a contracting thermoid faced steel band, acting on a drum at the rear of the transmission. This is controlled by a hand lever operating in a quadrant on the right side of the car. It operates a short cross shaft by means of a crank and rod and the motion of this shaft operates a cam which draws the ends of the contracting bands powerfully together, thus gripping the steel drum. The foot brakes are of expanding thermoid faced type and also act against steel drums 2½ in. face by 10-in. dia. bolted to the rear wheels. The left pedal controls the clutch alone

The steering gear employed, is Brown & Lipe's No. 3, mounted on the side member of the main frame and strongly braced to the sub-frame. The steering post has an angle to the horizontal of about 40 degrees, and its outside brass tube is fitted with a plate which is bolted through the laminated mahogany dash. The cross link of the steering rods is slightly curved to act as a spring to relieve the steering mechanism of severe road shocks and is placed at the rear of the front axle out of the way of road obstructions. The drag link is fitted at its ends with ball and socket shock relieving joints, passes above the axle and connects to a curved steering arm, which is high enough above the road to be clear of obstructions.

THE FRAME.

The frame following the most approved practice is of channel section pressed steel from 5 32-in. stock having 1½ in. flanges and 4½ in. greatest depth. The frame width is 33-in. narrowing to 26-in. at the front. A substantial sub-frame also of channel section pressed steel made from 3-16 in. stock has its side members mounted on special manganese bronze brackets riveted to the front and middle cross frame members.

The fenders are of the shield pattern webbed to the frame and made of steel and are well supported on T brackets the ends of which are mounted in tapered sockets riveted to the frame. The running boards are linoleum covered, brass edged and supported on pressed steel hangers

Gasoline, 14 gallons of which can be carried, is provided for by a galvanized iron tank under the front seat flowing to the carburetor by gravity, the inside of the tank is provided with splash plates to prevent the gasoline from getting into violent motion, and at the outlet of the tank a special straining device in the form of a trap is provided. The carburetor is of a special float feed design which has proven satisfactory when used with this two-cycle engine.

BODIES.

All bodies are of aluminum sheets formed over hardwood reinforced frames and finished in hand buffed leather, the standard color being Hessian red, upholstery in black. A large carrying space is provided under the rear seat, and is made accessible by a liberal sized door in the rear seat heel board which does away with the necessity of lifting cushions, etc.

Hartford tires 32 by 3½ in. on standard clincher rims are supplied as regular equipment.

The rear axle housing is so constructed that its rear portion can be removed, making it possible to take out the entire differential without even getting under the body.

AIR-COOLING

Although this motor is of two-cycle type it is air cooled, and this is accomplished without any special difficulty according to the makers. A 1-16-in. dia. 6 bladed aluminum fan is riveted to a hub of McAdamite metal and is mounted on a circle of ¼-in. balls and belt driven from an aluminum pulley on the crank shaft, the belt used is a ¾--in. V. This fan is mounted on a ¾ in. stud from the forward cylinder and the outer end braced by a bracket. The speed ratio is three to one, the flywheel spokes also form a very effective fan

These two-cycle cars are quiet running and are claimed to be exceptionally good hill climbers.

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"Millions for good roads—that is the slogan in the West and Middle West," says O. B. Henderson, sales manager of the Baker Motor Vehicle Co., who has just returned from a two months' tour of those sections. "The coast, especially, is going in for motoring stronger than ever.

"Why, one county alone, in California, has appropriated over a million dollars for improved roads. The cities are building boulevards. Seattle is spending a mint of money cutting down her hills. Improvement is going on everywhere.

"It's a prophecy wise dealers are heeding. Modern, substantial garages are being built in all auto centers. Foresighted business men are rushing to secure agencies in cities the good roads movement is opening up.

"Next year is going to be the biggest, by a wide margin, in the history of the trade.

"I find the demand for electrics growing by leaps and bounds. Years of steady growth have been followed by a sudden popular demand. I found electrics in many places where—a year ago—not one was in use."

# Details of the Curtiss Biplane

BY D SCRIBER

Probably no aeroplane has received more attention or will be more exhibited than that of Mr Glenn H. Curtiss, with which he won the International Cup at the Rheims meet in France, during the week of August 22nd of the current year, thereby bringing this famous meet to the United States in 1910. It will probably never be used again for flying purposes, but will be handed down as a keepsake and relic to be exhibited in different cities, and finally come to rest in some museum.

The Curtiss Biplane, shown in Fig. 1, is as its name signifies, of the two plane or bi-plane type, having an upper and lower

Fig. 1. View of Mr Glenn H. Curtiss in his famous Flyer at Hammondsport, N. Y. Detailed description of machine in text.

main supporting surface. These two supporting planes are about fifty-six inches from front to rear, and twenty-seven feet in width, and are spaced fifty-six inches apart. Each plane is made up of several sections which permits of easy transportation, and are not composed of canvas, but a very fine grade of China silk, coated with a rubber solution and known as double texture balloon cloth. It is light, waterproof and has considerable tensile strength. It is stretched very tightly by lacing it through eyelets in the cloth, to the laminated wood ribs which connect the main cross members forming the front and rear of each of the planes. Three successive stretchings are required to bring the cloth to the required tension. The frame work of these main planes is largely of spruce. The ribs are made in four layers, the two outer sections being ash, and the two inner sections spruce and are steamed and bent to a parabolic curve, the rods or frame work running to the rear to support the rear horizontal surface and the vertical rudder and the rods running to the front to support the forward horizontal rudder or elevator, are of bamboo, joined by metal ferrules and small bolts. The only other material used in the construction is ash of which the heavy rods which support the engine are made. These are the heaviest in the machine, and give a rigid frame work for carrying this important member.

In addition to the main planes, there is a very small supporting surface at the rear at the centre, and at right angles to it is a vertical rudder, that is, one whose axis is vertical and which steers the machine to the right or left exactly the same as the rudder of a ship. The small horizontal supporting surface acts as a tail to steady the machine, and is smaller than those used on most of the French machines. This rear supporting surface is entirely missing in the Wright machines.

### FRONT RUDDER

At the front are two small planes arranged one above the other very much the same fashion as the main planes. These constitute the elevator or front horizontal rudder, and are pivoted so that the wind will catch them on the under side or when tilted downward the wind will strike them on the upper side. Of course, when tilted upward so that the wind strikes the

under surface which is concave, the front end of the machine is lifted, and when inclined so that the wind strikes them on the upper surface, the front end of the machine is depressed. In the photograph shown, one of Mr. Curtiss, trying out his machine at Hammondsport, N. Y., a small triangular vertical plane is shown between the surfaces of the front elevator. This was subsequently dispensed with as useless.

We have now mentioned the rudder for steering to the right and left and that for going up or down. There still remain two small auxiliary planes which are clearly shown in the photographs at the extreme

Fig. 2. 50 H. P. Curtiss 8-cylinder motor as used in the machine in which he won the aviation prize at Rheims. This engine develops something over 50 H. P., is water cooled and weighs about 300 lbs. All 8 cylinders and the 16 valves are controlled by a single cam shaft making light weight possible.

right and left between the main supporting surfaces. These auxiliary planes are pivoted on a horizontal axis, along their front edges, and maintain the later stability or equilibrium.

GETTING INTO THE AIR.

The method of starting an aeroplane is a feature of interest. The aviator cannot start without assistance, because, as in an automobile, the motor has to be cranked, which would necessitate getting out of the machine. This cranking is done by an assistant, who grasps the propeller and turns it over until the engine starts. Other assistants hold back on the machine until the propeller gets up to seven hundred revolutions a minute, or in that neighborhood, when the machine is released, and shoots forward under the action of the propeller on its three 20-inch bicycle wheels attached to the under side of the frame work. The air propellers drive it forward the same as the propellers of a ship. As the machine rolls over the ground and gains headway, the lifting effect of the air on the under side of the slightly inclined surfaces finally becomes great enough to support the weight of the machine, and it will not fly if going at any less speed. On ordinarily smooth ground, sufficient headway to rise will be gained in one hundred and fifty to two hundred feet, but on rough ground three hundred feet is often necessary, and over some surfaces it is impossible for the machine to get up sufficient speed on its wheels to get off the earth. The aviator, as a rule, about the time the machine is at the proper speed to leave the ground, assists it by suddenly throwing up the forward edge of the front rudder, which helps lift it. The rudder is then immediately straightened out again.

During one flight Mr. Curtiss reached an altitude considerably greater than he had intended. Turning his front rudder to descend he found that owing to the peculiar upward current he was then in, the machine continued to go higher. With great presence of mind he got out of his seat and climbed forward on the bamboo rods so that his weight brought down the head of the machine, and he thus succeeded in coming down safely.

CONTROL MECHANISM.

The control mechanism of the Curtiss machine is extremely simple, and semi-automatic, that is, the front and rear rudders are under the aviator's control by means of a wheel which looks like an automobile steering wheel, which, however, is in reality a pulley, as a groove in its rim carries a small cable which runs through small sheves and through the centre of

the two long bamboo rods supporting the tail and connects with the rear rudder Turning the wheel therefore swings the rudder to any desired position, giving right or left steering. This steering wheel is arranged at the end of a pole which runs forward and connects with the front pivoted horizontal rudders, so that shoving the wheel forward inclines the front rudder downward for descending, and pulling the wheel toward the aviator tips the front edge upward for ascending.

LATERAL STABILITY

The lateral stability is made semi-automatic in an ingenious manner as follows: The seat for the operator consists of a chair bottom, the back and sides of the seat being formed of very light steel tubing. The upper tube is curved so as to touch the driver at both sides and at his back. This tube back is pivoted on the seat so that any inclination of the operator's body to the right or left carries the tubing with him, and this motion operates wire cables which connect with the right and left auxiliary planes. Thus if the wing tip to the aviator's right dips downward, he instinctively tips in the opposite direction, and this motion throws the rear edge of the right auxiliary plane downward, causing it to offer considerable more resistance to the air while at the same time it throws the rear edge of the left auxiliary plane upward causing it to catch the wind on the upper side and depress that side of the machine, quickly bringing the flyer to an even keel. This it will be seen is done without any special exertion on the part of the operator.

The motor is also under control either by means of a small throttle lever at the left of the driver's seat, or by a small lever operated by the toe of the left foot as desired For starting, the motor is run to about seventeen hundred revolutions, and during ordinary flying is probably not turning over twelve hundred revolutions per minute, at which speed, of course, it is entirely invisible, and cannot even be caught with the camera.

Just under the toe of the right foot is a short bamboo rod tipped with a metal cap

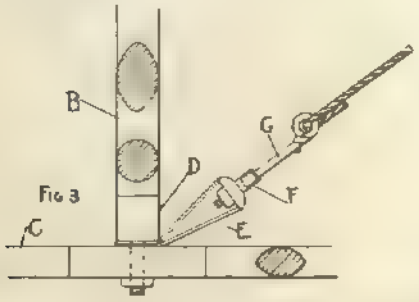


Fig. 3. Details of the method of fastening the uprights between the main supporting planes to the front and rear members of those planes, also the method of attaching the wire cables or bracing, as described in the text.

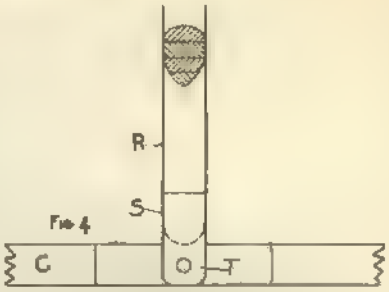


Fig. 4. Plan view showing one of the laminated wood ribs used in the Curtiss Biplane showing the ferrule made of steel about long and flattened at the end

for the foot to rest against, and the other end of it arranged with a spoon brake which comes against the tire of the front wheel. This gives a means of bringing the machine quickly to a stop after alighting in case it should be headed toward obstructions or a crowd of spectators. Cut-out wires are attached to this toe brake so that pushing the brake cuts off the ignition, thus stopping the motor.

THE MOTOR.

In Fig. 2 is shown a view of the Curtiss 8-cylinder racing motor used on the blue ribbon machine of the air which defeated all rivals at the Rheims meet, and was the means of bringing this contest to our own country for next year. It will be noted that the valves are in the head, both valves being operated by a single push rod and over-operated by a single push rod and overhead rocker, all eight push rods being controlled by cams, on a single cam shaft between the two rows of cylinders. This cam shaft is driven by the large spur gear which meshes with the smaller crank shaft gear below it. This ingenious arrangement saves considerable weight. The motor is rated as about fifty horse power, and weighs two hundred pounds complete. Between the two sets of cylinders can also be seen an ordinary centrifugal water pump driven by a short shaft and a gear meshing with the cam shaft gear. This pump forces water into a cross pipe which connects with headers on the lower side of each row of cylinders and supplies water to the lower portion of the jackets. The outlet for the water is at the cylinder heads and connections are made to a radiator of honeycomb type identical with those used on automobiles except of lighter design. This radiator is mounted just forward of the engine, and just to the rear of the aviator. A single carburetor of regulation float feed type is connected to a tube from which branch pipes run downward to each of the cylinders. Above the motor is a long cylindrical tank with torpedo ends which carries about five gallons of gasoline. This feeds to the carburetor beneath it by gravity. Underneath the motor base is a small lubricating tank from which oil is pumped to the crank case, splash taking care of the

various parts. On the racing machines a long narrow auxiliary pump is also placed where the aviator can push it with his foot to give the motor additional oil if desired.

This light motor is the secret of Curtiss' successes, as it is extremely efficient, very compact and powerful for its weight. It will be noticed that it is water cooled, although Mr. Curtiss has been building air cooled engines for many years. This in conjunction with the leaning of the Wright Brothers to water cooled motor is a significant indication of the feeling of American aviators in this matter.

The small engine supplied on the machines now is of a new design, four-cylinder vertical with 3¾ inch bore and 4 inch stroke. It develops 25 H. P. at 1300 R. P. M which it is claimed is the most power for the piston area yet secured in a gasoline engine. The cylinders are copper jacketed and have valves in the head Lubrication is by a force feed pump mounted on the cam shaft and the oil forced through the hollow shafts to the bearings. The water pump is also a part of the engine and mounted on the cam shaft. Ignition is by Bosch magneto driven by enclosed gears. The engine complete with pumps and magneto weighs 100 pounds.

DETAILS OF FRAME CONSTRUCTION

In the accompanying detail sketches are shown some of the methods of construction. A, Fig. 3 shows a detail of one of the upright supports, B between the main planes, and C one of the front members of the main planes. The upright B as shown, is of circular section near its lower end, and is tipped with a metal ferrule D which carries a threaded rod running through the cross member C, and is retained by a nut on the under side. The upper portion of piece B is of elliptical section presenting an edge to the front, its greatest depth being from front to rear. This view also shows in detail the method of attaching the stay wires. E is a metal strip the ends of which have holes through which the threaded bolt passes. F is a large sized motorcycle spoke nipple, and G is the end of a spoke coiled at the end, to form a loop through which the small wire cable passes and is soldered. This spoke nipple gives a means of tightening the stay wires as everything must be perfectly taut. This wire cable has several strands and is made of steel having a tensile strength of two hundred thousand pounds per square inch In Fig. 4 is shown a plan view of piece C, and one of the laminated ribs R which connect the front with the rear and forms the support for the fabric of the main planes The front end of this piece and its rear end are each fitted with a circular section ferrule S, the end of which as at F is flattened and drilled so that the bolt shown in Fig. 3 passes down through it. A section of these curved ribs is also shown. Throughout the construction the use of thin tubing is prominent, the tubes forming ferrules and the ends being flattened and drilled or the tubes being pressed into an elliptical shape to form ferrules for elliptical pieces. The entire machine is built in a neat workman-like manner, the ferrules being painted black and the wood finished in the natural color.

The regulation commercial machine is identical with the one above described with the exception of the motor, and sells for $7,500. Machines can also be had with racing motors for an additional price. With racing motor the weight complete is four hundred and fifty pounds or four hundred pounds with the smaller four-cylinder.

## TO FORM COMPANY

It is reported that a company holding ownership rights in all countries has been formed for the manufacture of the Wright aeroplane, which machine is contended to be the basis of all practicable aeroplanes. The Wright brothers are said to own the controlling interest in this country, while Mr. Charles R. Flint, a merchant widely known in the South American trade, and former head of the United States Rubber Company, who is organizing the new aeroplane business, will control all foreign factories. Suits for infringement of the Wright patents have already been begun against Bleriot, who flew the "Silver Streak," against Curtiss, the American, and against all others who use any flying machine resembling the Wright aeroplane.

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A legal battle to determine whether French aeroplanes which in any way use the warping wing principle infringe on the Wright patents was formally begun when the Compagnie Generale de Navigation de Aerienne, to which the Wrights sold their patents, made a "saisie-descriptive" of aeroplanes on exhibition at the Aeronautic Salon, Paris.

A "saisie-descriptive" does not involve the seizure of the machine, but is a process whereby an official description of a machine is recorded for the future benefit of the court and constitutes in effect an injunction.

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Parisian dressmakers are now perfecting a suitable sky costume for progressive women who motor on high. The costume does not include skirts, but instead canvas Knickerbockers, army puttees and strong shoes. A woolen sweater, waterproof hood, automobile gauntlets and goggles if necessary, complete the costume.

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As a "sign of the times" we find the foreign toy shops are full of actual working models of the various airships—some of them having real gasoline motors, making long flights, costing about $60.

# The Empire "Twenty"

One of the newcomers in the 1910 market is the Empire car. The Empire factory adds another automobile plant to the list of Indianapolis manufacturers. This car has been under development for the past year and the company maintains that through long and careful experimental work it has reached a very high state of perfection.

The Empire cars are put out in two models, namely, Model A and Model B. There is very little difference between the chassis of these two models, but the outward appearance differs considerably.

stretching of the exposed chain drive. This form of drive makes it possible to use a four sided platform spring suspension in the rear, which makes the car easy riding and extremely easy on tires.

The chassis differs considerably from the conventional type of the present day car in that the power plant is not dependent on the frame for alignment of working parts. In fact, the power plant is the backbone of the car. The front of the motor is bolted to the frame at the central point of the front cross member. At the rear of the fly wheel housing is a large

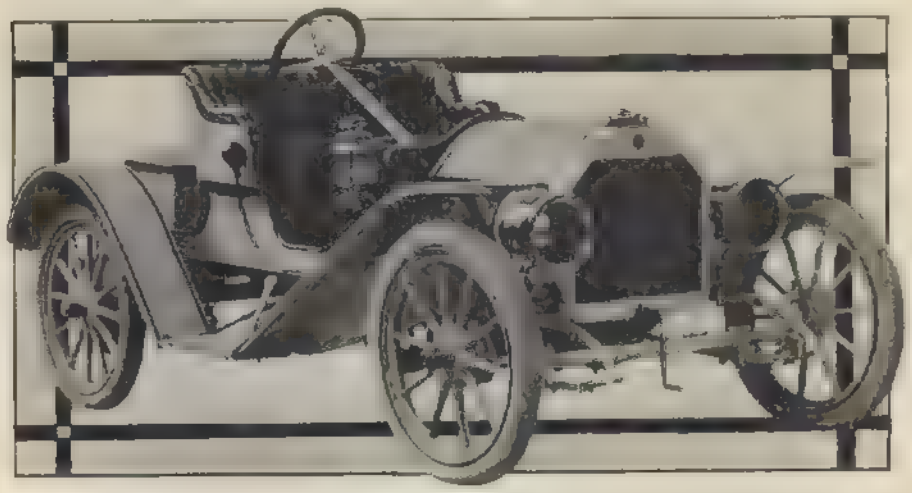


Fig. 1. Three-quarter view of the Empire "Twenty" Model A, 96-in. wheel base, 32x3½ in. tires with quick detachable rims, 20 H. P. motor 4-cylinder, cast "en bloc," 3½ in. bore x 4 in. stroke, water cooled valves 1⅝ in. dia on opposite sides, splash system lubrication, cone clutch, selective sliding gear transmission two speeds forward and one reverse, spark and throttle levers on steering column directly beneath the steering wheel clutch and transmission brakes operated by pedal with ratchet stop, gasoline capacity, 11½ gallons. Equipment 3 side oil lamps, tail lamp, horn, tools and tire repair kit. Price $800 f. o. b. Indianapolis.

In the Model A car the body is more of the conventional form of runabout type being suitable for three passengers by the addition of a rumble seat to the rear luck box.

The Model B is of distinctly race lines. A round tank is carried on the rear deck, the gasoline being fed by means of a pressure pump to the carburetor. A large 18 in. steering wheel is used and a hand brake lever is added to the side. The car, when thus equipped, is considerably lighter than the Model A car enabling it to carry a higher gear and making it a very speedy little roadster.

CHASSIS.

The principal features of the car are the chain drive and exceptionally easy riding qualities. The company claims to have developed a side chain drive which is more satisfactory than the average shaft drive. The chains are entirely enclosed in dust proof cases and these cases make them absolutely quiet and prevent the usual

steel flange into which a 3¾ in. steel tube is securely fastened. A similar flange on the rear end of this tube connects with the transmission, and the transmission is in turn supported at the ends of the frame, thus making a complete rigid unit supported at three points.

The drive from the motor to the transmission is absolutely a straight line, there being no universal joints on the car.

The frame is built up of Cumbria mild open hearth steel, the stock being the same as that used in bridge construction.

The fly wheel and clutch are completely enclosed in an aluminum housing. This housing has a large inspection plate in it and removing this plate allows examination of the clutch facing if necessary. The clutch is of the cone type, having an aluminum web faced with a patented composition facing, which makes it a very easy clutch to engage, and it has no tendency to slip.

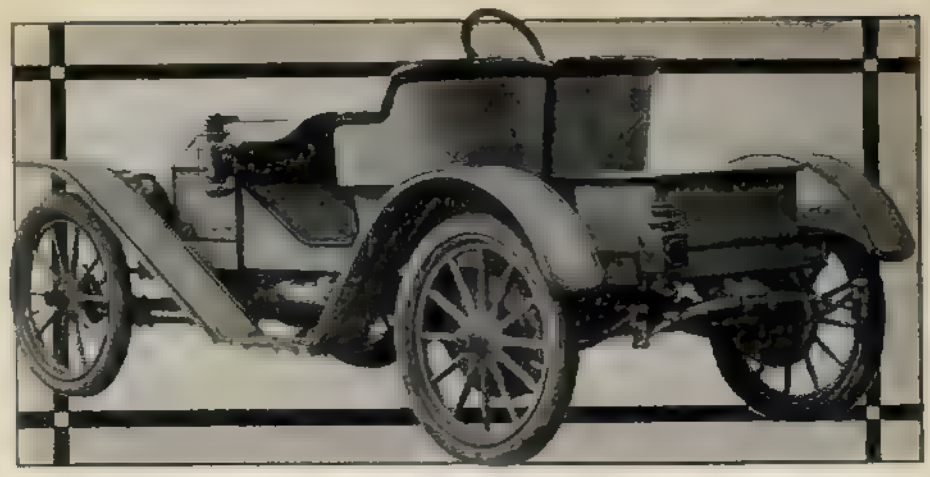


Fig 2. Rear view of the Empire "Twenty" Model A showing the high road clearance also the large luggage box on which a rumble seat can be placed

Ignition is by high tension magneto and transformer coil with a battery system used as an auxiliary, one set of plugs serving for either. The plugs are placed directly over the intake valves, insuring cool and clean sparking points. The magneto is driven from the timing gear of the motor by a large coupling of the Oldham type.

MOTOR.

The motor is of the water cooled type, having four cylinders cast "en bloc," dimensions 3½-in. bore by 4-in. stroke. This gives 19 3-5 H. P. by the A. L. A. M. rating, but as a matter of fact, the motor develops a little in excess of this, on account of the longer stroke.

The cylinder assembly is a radical departure from the usual lines of motor construction as may be noted by referring to Fig. 7, all of which shown being cast in one piece. A is the inside of the cylinder, B is the space into which the cylinder head is placed. The cylinder head is cast separately from the cylinder proper, and is held down by means of 20 studs and case hardened nuts, a copper asbestos gasket of the McKim type being used as packing. The intake manifold is cast integral and designated by the letter C, while D is the branch leading to the cylinder, E and F are the exhaust manifold and branch respectively. G, G are the water feed and return, while the letter H indicates the valve seats and openings for the valve stems and guides. The valves are 1¾-in. in diameter, which is just half the piston diameter, and they are placed on opposite sides. The valve stems are threaded and a hardened blind nut

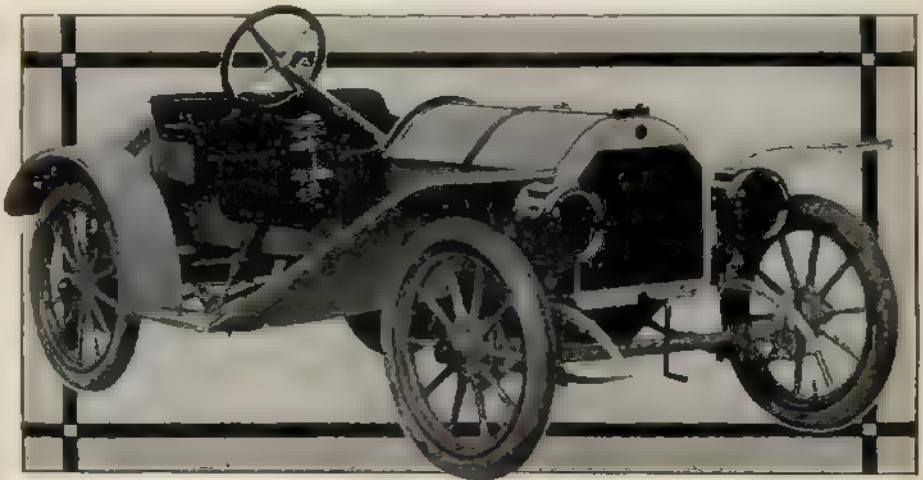


Fig 3. Empire "Twenty" Model B showing the McCord vertical tube radiator. The headpiece of this design shows another view of the same model. Particular attention is called to the extremely racy lines of this construction. Chassis of this car is the same as that of Model A, with the addition of a set of brakes on the rear wheels controlled by a hand lever. Price $850

and a hardened lock nut serve as an adjustment for the clearance between the valve and lifter, also giving a larger bearing surface where the valve strikes the lifter, thus obviating any tendency for the valve to dig into the lifter.

There is no water joint between the head and the cylinder, thus preventing any leakage of water into the cylinder barrels. The removable head makes it possible to remove any or all pistons and rods without dismantling any piping or disturbing any electrical conections, except the terminals of the spark plugs The cylinders are made of very fine grade of gray iron. They are first rough bored, then annealed and allowed to rearrange their molecular structure. They are then rough reamed and set aside for a similar seasoning process, after which they are finished reamed. The crank shafts are made of 20 point carbon steel, drop forged and heat treated. After rough turning they are ground to the limits of .0005-in. on their diameters. These crank shafts are extremely rigid, due to the wide web and large diameter of the main bearings. The main bearings are of Parson's white bronze as are also the crank pin bearings. The connecting rods are drop forged, and on the lower end of the connecting rod cap a knife blade 2½-in. long is forged integral with same. These knife blades dip into the compartment in the crank case, thus making a very simple splash system of lubrication. The crank case compartment holds sufficient oil for from 75 to 100 miles running, and is replenished from an auxiliary tank by means of a hand pump which is mounted on the heel board. This form of splash lubrication makes a very durable one as there are no working parts which are liable to go wrong such as mechanical pumps and sight feeds

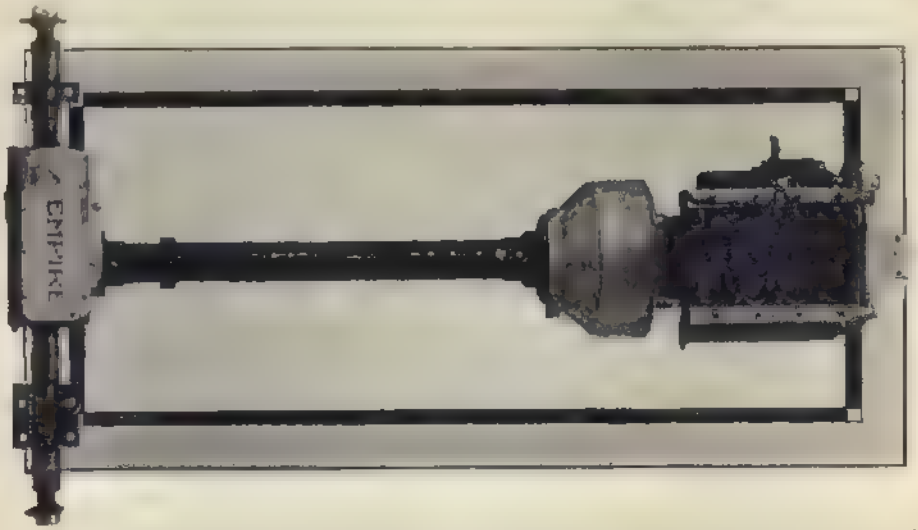



Fig. 4. Power plant transmission and jack shaft. Note the unusual placing of the gear case parallel to the jack shaft. Also the three point suspension formed by the forward end of the motor and the extreme ends of the transmission arms. On the ends of these arms are the balls on which the chain cases swivel

TRANSMISSION

The transmission is of the two speed selective sliding gear type, direct drive on bevel gears. It is claimed by the company that this transmission is very durable and that there is little power lost in it, due to the small reduction from the propeller shaft to the counter shaft, namely, a ratio of 1 to 1.33. The case proper is made of aluminum, while its supporting arms are of steel, these arms forming a rear member of the three point support for the complete power unit. On the ends of these arms are mounted two steel balls of large diameter, the forward ends of the pressed steel chain cases swivel on these balls, thus forming a ball joint for the cases. The latter also act as strut rods. On the counter shaft of the transmission is mounted a contracting band brake, this brake being lined with a patented composition lining. The brake is actuated by the clutch pedal and in order that the clutch spring will not be weakened by the use of this transmission brake, a cam motion for releasing the clutch is resorted to. A slight pressure on the clutch pedal releases the clutch, and further pressure applies the transmission brake, but does not compress the clutch spring beyond its initial compression

REAR AXLE

The rear axle is built up from two inch tubing with 7-32-in. wall. Into this tubing are fastened the rear axle spindles, these latter being 1 5-16-in. in diameter. The rear hub sprockets are drop forgings bolted to the hubs of the rear wheels.

These forgings are turned on the internal diameter, forming brake drums for the rear hub brakes, the latter being of bronze, ten inches in diameter and one and one half inches wide on their face. The chain cases also enclose these brakes making the entire mechanism dust proof throughout. The chains are of the roller

Fig. 5. Intake side of the Empire "Twenty" motor showing magneto and carburetor location. Note the general simplicity of design

type, diamond No 300, ¾ pitch and 15 32 diameter roller, this size being unusually large for a car of this weight. The chain adjustment is secured by means of a pressed steel clamping ring. This ring fits over the ball joint on the transmission arms. An eccentric throw of ¾-in. serves to loosen or tighten the chains.

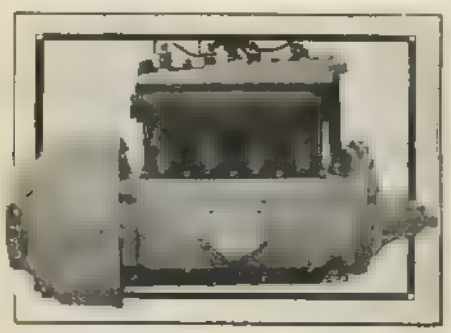


Fig. 6. Exhaust side of the Empire "Twenty" motor showing the cone clutch housing. Attention is called to the clutch housing inspection plate and the inspection plate on the crank case

FRONT AXLE

The front axle is built up from 2-in tubing having 7-32-in. wall. The steering knuckles are of generous proportions and are brazed to the 2 in. tubing. The axle spindles are 1 5-16-in. in diameter, this being the same as the rear.

WHEELS AND TIRES.

The front wheels have ten spokes 1¼-in in diameter, second growth hickory. The rears have twelve spokes of the same size and material. The hubs have cup and cone type bearings, with half inch balls at the outer end and ⅝-in. at the inner end. The wheels are fitted with quick detachable rims and 32 x 3½ in. tires. Hub caps are brass stampings.

CONTROL.

The spark and throttle levers are mounted on the steering column directly beneath the steering wheel, and an accelerator pedal is interconnected with the throttle lever on the steering column. The gear shift lever is at the driver's right operating in an H slot. On both Model A and B, the clutch and transmission brakes are operated by pedal having a ratchet attachment, while on Model B, the rear hub brakes are operated by hand lever and ratchet.

All brake rods have a turn buckle adjustment which is spring retained, making brake adjustment very easy, as the brake rods can be lengthened or shortened by the turn buckle which automatically locks itself in any position.

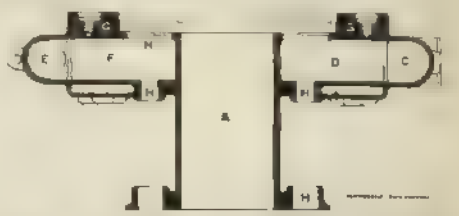



Fig. 7. Cross section through cylinder of the Empire "Twenty" motor showing the intake and exhaust manifolds which are cast integral with the cylinders. Detailed explanation of letters given in text.

The steering gear is of the pinion and sector type, pinion shaft being hardened and ground and both bearings are of Parson's white bronze. These parts are enclosed in a dust proof aluminum case.

A genuine mahogany rim 15 inches in diameter on Model A and 18 inches for Model B is used for the hand wheel, the web being of aluminum

GASOLINE CAPACITY

On the Model A cars a square tank with a brass settling chamber is carried under the seat, feed to the carburetor being by gravity. The tank holds 11½ gallons.

On the Model B, the tank is carried on the rear deck and holds 12½ gallons. Gasoline is fed to the carburetor by pressure feed.

FINISH AND EQUIPMENT

The Empire cars are regularly finished in a light gray with black striping. The dash boards are mahogany and all parts such as throttle and spark control levers, steering column side levers, etc., are brass and the running boards are aluminum

The cars are regularly equipped with oil side lamps, tail lamp, horn and tube, tools and kit and tire tools.

The price is $800 for the Model A car, and for the Model B car, $850 f. o. b Indianapolis.

# The Ford Motor Company

Henry Ford and the Present Ford Plant; showing thousands of parts which could not be placed in the buildings, stacked in the yard In the upper right corner are seen 40,000 automobile wheels.

IN 1891 an humble mechanic in a Detroit machine shop manufactured, in his spare time, a motor car. The car didn't amount to much in the way of looks and its owner, builder and operator had some trouble in getting it to carry him about. But it would go on occasions and it proved conclusively to its inventor that the gas engine was an adequate, economical and satisfactory method of solving one of the problems of rapid transit.

That car is now the most prized possession of the Ford Motor Co., and occupies a position of honor among the archives of the big plant. It was the first car built by Henry Ford and the first automobile made in Detroit

Accounts of Henry Ford's early struggles in the endeavor to secure funds to pursue his inventive ambition and, at the same time, to earn a living for himself and his family, are common talk about Detroit. A farmer boy, but a natural mechanical genius, he had come to Detroit, a few miles away, to make his living. Running a machine all day and making parts for gas engines, started him to thinking on this line, perhaps. At any rate, he made engines his study. The first car was, as most inventions of the sort, a crude contrivance. Working at his trade in the day, studying and working on his inventions at night, he kept plugging away. After several years of effort he discarded the little buggy-like one-cylinder runabout and drafted designs for a more ambitious car. Other men had been working along similar lines, but with more opportunity to follow out their ideas. Ford saw their work and passed judgment. The years passed and, in 1901, Henry Ford designed what was probably the first practical two-cylinder opposed engine, mounted for use on a motor car. A friend who had saved a little money by running an all-night lunch-wagon on the street corner, saw the possibilities and took a chance. With the funds thus secured, Henry Ford resigned his job in the machine shop and went to work in a little one-story shed, to build his car

The car was finished in the spring of 1902. Ford fitted it with a seat for racing and the Detroit public saw it at the first automobile race meeting ever held in Michigan, later on in the year. Over the classic Grosse Pointe race track Ford and Alexander Winton, of Cleveland, the only entries in the free-for-all events, raced it out in a thrilling duel. Winton was at that time the track champion of the country. Ford beat him

But even then the expected results of Ford's inventive genius were not forth coming. Offers for the sale of his patents were made, it was true, but none of them were accepted, for Henry Ford meant to hold to his car until he could be certain of the control of its manufacture.

In 1903, backed by Tom Cooper, the bicycle champion, Ford built two more cars, perfect twins. Each, like its predecessor of the year before, was a racing car, but compared with the 1902 model, the new creation was a juggernaut. Four cylinders of enormous size gave it the power of 80 horse. When its engine started the roar could be heard for miles. Flames flashed from the motor. In the middle of its massive frame work was one seat. One

along the line. The Packard put out 2,300 high-power cars, another high water mark. The Anderson Carriage Co., which had made a short campaign the preceding year, doubled its output of Detroit Electrics. The Hupp Motor Co. turned out 500 Hupmobiles and Brush Runabouts to the number of 2,500 swelled the total. The Regal leaped from 500 to 3,000 and more. The Chalmers-Detroit nearly doubled its record of 1908. The Hudson, a newcomer, made 1,000 cars and the Grabowski entered the field of truck manufacturing. The year's total foots up to nearly 38,000 cars, the majority of which are the prevailing type of light, four-cylinder model.

## THE 1910 OUTPUT

IN 1910 the output of the Detroit factories will be limited only by the amount of material which can be secured by the manufacturers.. In no other season has the prospect for sales been so bright. Ford promises 17,500 cars. The E M-F. followed the change in its directorate in which Messrs. Everitt, Metzger and Kelly disposed of their interests to the Studebakers of South Bend, by announcing an output of 15,200 cars from their original factory, and through the purchase of the De Luxe plant, expect to add 25,000 Studebaker-Flanders Twenties to this list, making them the largest producers in the city. The Brush Runabout has made contracts for material for 10,000 cars. The Cadillac expects to market 7,500. The Packard has plans laid for 8,300. The Hupp will make 5,000. The Chalmers-Detroit is hampered by construction work, but is using its new factory room as fast as it is being finished and expects to get out 6,000 cars. Five thousand is the Regal's figure. The Hudson's plans also contemplate 5,000 cars. The Anderson Carriage Co. has greatly enlarged its plant and there will be more Detroit Electrics than even in 1909. The newly organized Metzger Motor Car Co. will manufacture 2,500 Everitt Thirties before June, when it will start work on its 1911 model. The Demotcar, the Kritt, the Warren, the Anhut, and the Paige-Detroit, all new companies, are busily engaged on construction work. New buildings are under construction at virtually every plant in Detroit. The immense output of over 90,000 cars predicted can hardly be reached, say the makers of parts. Someone is bound to be disappointed. But plants are running day and night. For months the sidings of the railroads communicating with the Detroit factories have been glutted with freight-cars, coming in empty but going out, loaded with motor cars. Many of the factories at this time are running at capacity which will enable them to reach their schedule if continued through the remainder of the manufacturing season. Detroit is learning annually more about the art of manufacturing automobiles and predictions that would have been discounted in former years are more nearly capable of fulfillment now, for they are made, as a rule, by men who know

## "DETROIT THE AUTOMOBILE CITY."

AND Detroit lives, moves and has her being from the motor car. People talk automobile at their business, at their luncheon, in their sleep. Grimy laborers trade factory secrets on the rear platforms of street cars on their way home from work. Every mechanic is an inventor in his odd hours and Detroit makes more applications for patents than any town of its size in the world. The rough rig of the factory tester is almost never out of sight on any well paved street. Fifty thousand men are at work on the city's annual output of automobiles and $7,000,000 is the sum represented in the equipment of its factories devoted exclusively to the purpose.

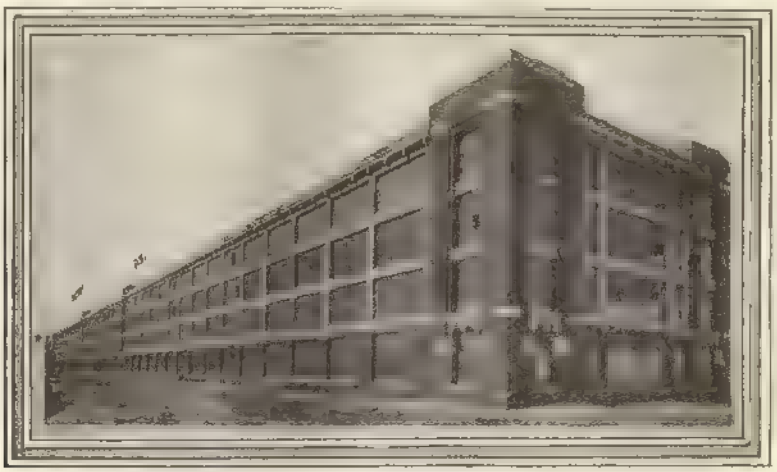
In no industry could there exist more cordial relations between the employers and the employes than have been evident in Detroit throughout the history of automobile manufacturing The wages have been uniformly higher, even to unskilled labor, than in any similar kind of effort. There has never been any combination of capital to lower the standard or have the workers unionized in what would have been bound to be an ill-starred attempt to raise the present scale. Open shop prevails throughout the industry, not only in the automobile factories but also in the allied industries. It would be impossible to find a better satisfied host of employes than the one which labors on the motor cars produced in Detroit.

Undoubtedly the natural advantages of Detroit have played a prominent part in the centralizing of the industry. The city's limits extend without natural boundary on three sides and cheap homes have been within reach of all. There is probably no city of its size in the country where pleasures are so cheap and so varied. Belle Isle itself, the municipal pleasure ground, has undoubtedly been of material assistance in attracting desirable workers to Detroit and keeping them there.

Detroit has had a sobriquet from time immemorial. They have called her "The City of the Straits." But people are fast forgetting the geographical cognomen. "The Automobile City" is the title by which she prefers to be known and it is a title which she surely merits and of which she is justly proud.

life at a time was the limit that Henry Ford said should be risked in it. They called the pair the "999" and the "Arrow."

Ford and Cooper tried one of the cars out and were awed by its speed. Neither wanted to take the responsibility of driving it in the races of that year. Cooper, however, vouchsafed the opinion that he knew a man who feared absolutely nothing under the sun. He wired to Salt Lake City and brought on one Barney Oldfield, at that time a professional bicycle rider



The Ford Company's Four Story Plant.

who had ridden with Cooper. Barney had never driven a motor car, but in a week, Cooper and Ford taught him. The day of the race arrived and the free-for-all was called. Seating himself in the middle of the juggernaut and assuming a firm grasp on the two-handed tiller by which it was steered, Barney remarked, "Well, this chariot may kill me, but they'll say afterwards that I was going like hell when she took me over the bank." Ford cranked the engine and they were off

It was a big field but the rest were nowhere after the first half mile. Oldfield never dared to look around, but gave the car all the speed she could kick up in the straights. Nor did he shut off on the curves. He kept drawing away from his astounded field, but drove as if the others were right on his heels. His long hair snapped in the wind. He won by something like a half-mile from his nearest competitor in a three mile race.

That event convinced the world that Henry Ford was an engineering genius. In the following week a company was formed and Ford was made vice-president. He was also designer, master mechanic, superintendent and general manager. The company built several hundred cars of the double-opposed type with detachable tonneau. These were marketed during the year of 1903. A larger number—nearly a thousand—were put out in 1904. For 1905 Ford designed a four-cylinder car. Racing had demonstrated itself as an effective method of exploitation before and Henry Ford planned a similar demonstration for his 1905 model. This came the week before the big show in New York and took place on the frozen surface of Lake St. Clair where, with Ford himself as the driver, the twin machine to the old "999" greatly improved and looking very much like a modern racer, was sent a surveyed mile straightaway in the record-breaking time of 39 1-5 seconds.

Those who saw that effort will always regard it as the most thrilling sight of their lives. The ice, apparently smooth, was in reality seamed with slight fissures. At every one of these the car would leap into the air, two wheels at a time. Ford's course was a zig-zag as a result, but he kept the machine generally on its course, shooting it past the finish in safety. The world's record was broken by over seven seconds.

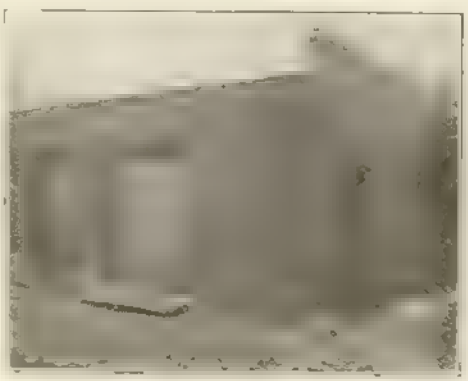
The performance ensured the success of the 1905 model in the selling field. The Ford Motor Co. left the rented Mack avenue plant and built a factory of its own on Piquette avenue. The firm devoted most of 1906 to the advance work on a model which was to mark an epoch in automobile building—a light, four-cylinder runabout.

In the plans for this car Henry Ford laid down the maxim that, by the investment of a huge sum in special machinery, the cost of production of a large number of cars at a formerly unheard-of price would be possible. The utmost care was taken to have the parts of the car absolutely machined to size. No supplementary fitting was possible in the scheme. Every part must go into place without causing a mom-

ent's delay in the assembly room. And Ford proposed to put out 10,000 of these cars in one year.

The manufacturing world stood aghast. Only a very few believed that Ford would progress far with so radical a departure. But he did. That year the Ford sprang into the limelight as the largest producer of motor cars the world had ever known. And the principles laid down in Henry Ford's general scheme are substantially those that prevail in the industry to-day, except in the cases where a firm's output is not numerically great enough to warrant the initial expense.

The success of 1907 was repeated in 1908. During the season just closing and on even more radical lines, the same process was repeated. During 1909 the company dropped the manufacture of six-cylinder cars, turned out in large numbers during 1907, and centralized its whole energies on one [illegible] model of which 17 [illegible] been marketed.



Birthplace of the First Ford Car

More than a year ago it became evident that the present plant of the Ford was too small for the plans which the company had made. A large tract of land was purchased in the northern part of the city and there has been built a factory a fifth of a mile long, fronting on Woodward avenue. Four stories in height, 75 feet in width and of cement and steel, the factory is one of the most modern in construction ideas. The walls are largely of glass. In the rear is an immense foundry under construction. Part of the 60-acre tract is occupied by a mile track which is now in use for testing purposes. As fast as deliveries will permit the company is installing a complete new set of machinery. Virtually none of the equipment of the old plant will be used in the new one.

And the automobile world is waiting listening to hear the announcement from Henry Ford as to the product. Whether or not he has another sensation in store is about the liveliest topic of discussion in Detroit manufacturing circles—nay even throughout the world.

In no factory organization in Detroit is the personality of one man so interest-compelling as at the Ford. The farmer-boy machine-hand-inventor of former days is the largest millionaire in his millionaire concern. The most famous of the gas-engine designers, and now the president of his own factory organization, he is present every day in the factory laboratory. His name is now borne by 40,000 motor cars in active service. About his new factory is growing up a veritable city, made possible by his industry.

There have been several important changes in the department heads and the officers and directors of the original Ford Motor Co. But they have never affected the firm's progress to a noticeable degree. Most prominent in the support of the inspiring genius and with him since his first essay in the manufacturing field are and have always been James Couzens, secretary of the company, and C. Harold Wills, the factory superintendent. Mr. Wills was with Mr. Ford when he was building the "999." Mr. Couzens was his aide in interesting the capital that made the first Ford factory a possibility.

No extended reference to the Ford Motor Co. would be complete without mention of the legal battle which the firm has waged with the Association of Licensed Automobile Manufacturers, lessees of the famous Selden patent. At the time the Ford Motor Co. was organized virtually all the manufacturing concerns in the country paid tribute to the association or its predecessors, in the form of royalties. Henry Ford balked. He had built and operated a gas-propelled motor car years before the patent was granted and he refused flatly to make the payments. The association brought suit and for six years the battle has been fought in the courts. During the season just closed a decision was handed down, affirming the patent. The Ford Motor Co. has as yet outlined no course for the future. That it will continue to fight, carrying the case to the court of last resort, is believed certain in Detroit, in spite of the fact that the Ford has been deserted by many of its allies in the patent fight and finds the manufacturers' organization which formed to assist it in the battle against the Selden patent, materially weakened by the defection of some of its most prominent members.

# 1909 George White Gasoline Cars

The George White Buggy Co., of Rock Island, Ill., have placed on the market for 1909 a line of high-wheel gasoline cars all based on a single chassis. The object has been to produce a car at a reasonable price with as few parts as possible and one simple of operation, a car which it is intended can be operated by a lady and the upkeep of which will not exceed that of a horse and buggy. These machines are of the high-wheel type fitted with solid tires and are intended for those who desire a machine of simple operation, economy of maintenance, although of somewhat less speed than the regulation touring cars. The claim is made that the very best materials are used

The arrangement of the parts is in all respects similar to standard touring car practice, the motor being crosswise under the hood at the front with a planetary change speed gear giving two speeds forward and reverse, housed in a case attached to the engine and shaft drive to a bevel gear rear axle.

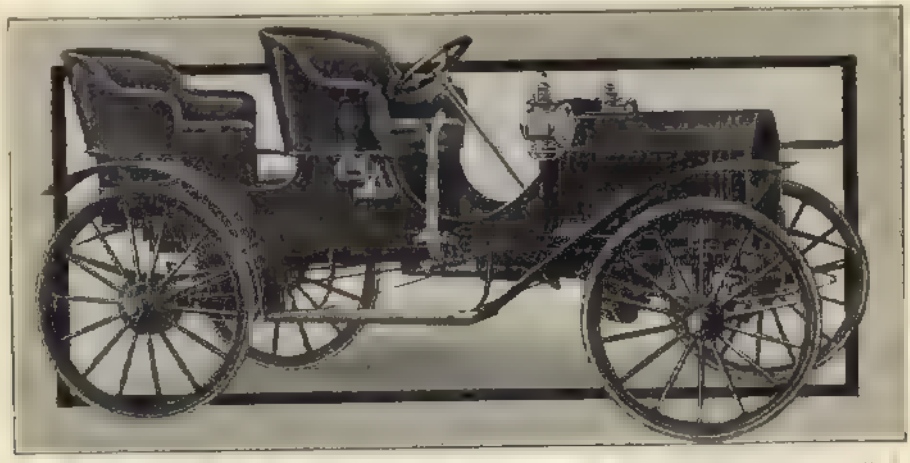


Fig. 1. 1909 White Gasoline Car built by the George White Buggy Co. Motor 2 cylinder air cooled, 4¼ inch bore, 4 inch stroke, crosswise under the hood at the front, 14 H. P. Standard planetary type two speeds and reverse transmission, operating a live shaft drive to differential rear axle mounted on roller bearings. 38 inch front and 36 inch rear wheels fitted with ¾ inch Firestone clincher tires. Wheel base 70 inches, tread 56 inches. Equipment, one pair of side oil lamps, oil tail lamp, horn, Bee's rubber floor mat and rubber-covered running boards. Price $800 without top, $835 with top.

THE MOTOR.

The engine is of the two-cylinder opposed air-cooled type of 4¼-inch bore and 4-inch stroke, located crosswise at the front on the angle steel frame which is hot riveted and reinforced with wood sills. The cylinders are directly in line with the throw of the cranks, so that straight drop-forged connecting rods can be used. The crankshaft is also a drop forging. The inlet and exhaust valves are seated in removable cages, and are both mechanically operated. The crank case is divided into two parts, the upper one carrying the complete valve operating mechanism and the lower half the crankshaft, cylinders and self-contained oiling system. The transmission case is an integral extension of the lower portion of the crank case, thus insuring perfect alignment. This transmission is of the standard planetary type giving two speeds forward and one reverse, the low and reverse speeds being operated by bands and the high by a multiple disc clutch. All gears are cut from

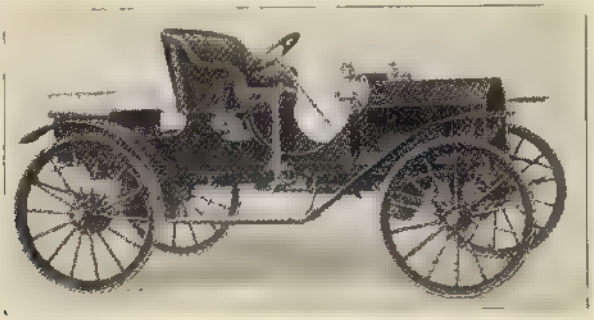


Fig. 2. White Gasoline Car, Model A. Same chassis as Fig. 1. $750 without rumble or military box, $775 with rumble box, rail and cushion, as shown.

much excited, and when after about twenty minutes I tried to start the motor, the pistons and cylinders were as a solid body. The pistons later could not be taken out, even after heating cylinders, and had to be broken. After reboring the cylinders, making new pistons, etc., the motor was put in running order again. If the motor is kept going and gradually cooled off and given plenty of oil anyone can save trouble. A gallon of oil is cheaper than a cylinder inspection. When a bearing runs hot, no matter where, if there is a chance to pour oil on it, keep the motor going and also the hot bearing, and if powdered sulphur is handy, mix a small quantity with oil and inject. Keep adding oil or even a little cold water, until the bearing cools down.

The usual belief is, that a burning bearing will cut the shaft, etc. The original cutting or friction of some hard substance cut the shaft or bearing first, which caused heating, and its continuous running will not add to the damage. Many a bearing box, bushing, and even parts of crank cases and gear box cases, have to be chipped off with hammer and chisel.

As soon as a bearing is allowed to cool quickly, it is bound to seize, and nine cases out of ten, cannot be moved again until the proper repairs are made. Again—keep them running

HUGO V. ROSECK

## NOTES FOR THE NOVICE

A good grade of grease is usually considered better than vaseline as a lubricant for ball bearings.

If an acetylene headlight throws its flame too high, the trouble, in all probability is due to clogged burner openings.

Worn gear wheels are almost insatiable in the matter of lubrication, and should be well looked after, as they are subject to considerable friction.

When a water pipe on the radiator leaks, satisfactory temporary repair can be made by winding round several layers of string well soaked in thick oil.

A handy thing for the motorist to keep in his tool box is an assortment of wire nails of various sizes. These nails may often be used to replace split pins and the like.

An English motorist has suggested that a good cure for dirty sparking plugs is to run the engine for some little time with the compression taps wide open, and with as weak a mixture as possible.

One or more of the pistons seizing, owing to the failure of the lubrication, will make it hard to turn over the engine. A little kerosene injected into the cylinders will usually remedy the trouble.

Never put an inner tube uncovered into a box full of loose tools, oil cans, etc. The tube will chafe and the oil will rot it so that if it holds air at all when inflated it may soon burst under the weight of the car

An excellent method of keeping the glass of a wind shield clear on a rainy day is to rub the outside of the glass with a rag dipped in glycerine or kerosene. The glass will at first appear dull, but as soon as it is rained upon it will become as clear as though it had been dried.

One of the commonest reasons for oil lamps going out is the choking of the draught holes in the cap of the lamp by deposits of carbon. These should be looked for and removed before any lengthy drive at night. The other essentials are a good lamp, good oil, and a clean, dry wick.

If gasoline drips from the carburetor when the car is standing with the engine stopped, the needle valve connecting with the float should be investigated. If pressing it down stops the dripping, the float is too high. If the dripping persists, the valve leaks and should be ground to a fit, preferably using pumice stone.

When a motorist has become somewhat expert in the running of his car it will be found advantageous to gradually feed until the point is found at which the motor runs well, but will not stand a further reduction. The smaller the proportion of gasoline the more economically the motor will run and the cleaner it will keep.

A frequent cause of leaks in radiators is that the vents in the filling caps and overflows become choked with sediment or dust, with the consequence that steam accumulates in the radiator, and the pressure, seeking an outlet, forces an opening at the weakest point. A little attention to the vent will remove the cause of the trouble.

The plates in some multiple disk clutches have a tendency to hang together in cold weather because of congealed oil. By mixing the lubricating oil used with kerosene in about equal parts or even with the kerosene predominating, much of the trouble will be eliminated. Disk clutches, too, need frequent cleaning, first with kerosene, then with gasoline.

A handy thing for the motorist who does much touring or following of road maps to have either on the dash or in some convenient part of the car is a compass. It many times happens that in traveling a winding road one soon loses all idea of the actual direction he is going, and a turn incorrectly made may bring him far off his course and thus cause him to lose considerable time.

solid steel, properly hardened and run in bronze bushes. The entire mechanism operates in an oil bath. The combined engine and transmission form a unit mounted on three points, two of which are the cylinder heads and the third is at the rear under the change speed gear case which is supported on a cross frame member.

The transmission of power to the rear axle is through a universal joint and an enclosed driving shaft, the housing of which serves as a torsion tube and is braced to the rear axle, doing away with the necessity for radius rods.

The rear axle assembly is by Weston Mott, of Flint, Mich., and is the same as used on many high grade 1909 cars. It is of the standard bevel gear type, fitted

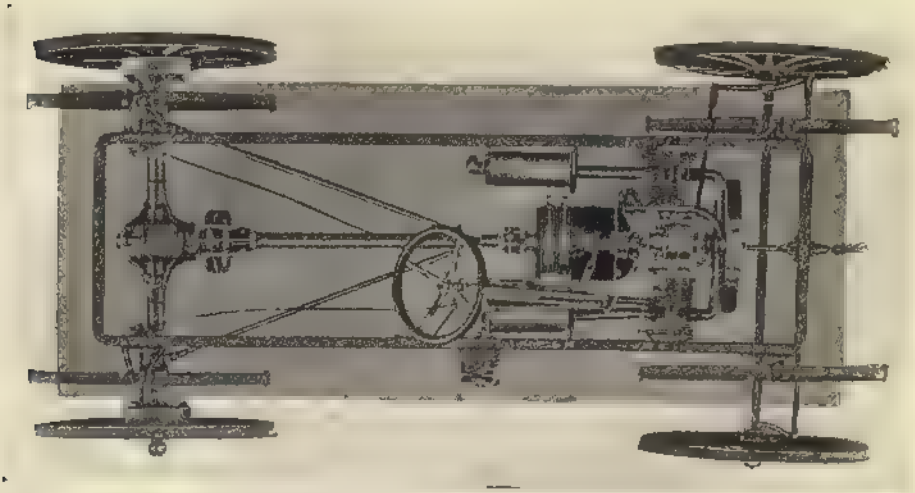


FIG. 3. Plan view of 1909 White Gasoline Car chassis showing the 14 H. P. air-cooled motor at the front planetary transmission, operated by single side levers, and regular automobile bevel gear rear axle assembly. Two mufflers are used one for each cylinder, mechanical force feed lubrication, magneto ignition using two unit coil internal expanding brakes in hubs, 36 inches C to C, full elliptic springs front and rear frame angle steel, hot riveted re-inforced with wood sills, tires 3½ inches. Plain one side wire. Wheel base 90 inches tread 56 inches.

with internal expanding hub brakes and is specially trussed for use on high wheel cars. The wheels are 36 inches front and 38 inches rear, fitted with 14 spokes of second growth hickory with heavy artillery hubs. The front wheels are mounted on ball bearings, while the rear wheels are keyed direct to the live axles.

The steering gear is by means of a pinion and rack of the company's own make, operated by the usual hand wheel upon the top of which is mounted the usual spark and throttle levers. Connections to the timer and carburetor are claimed to be practically without back-lash. A Sheb-ler float feed carburetor is used, fed by gravity from an eight-gallon gasoline tank under the driver's seat.

A mechanical force feed oiler provides lubrication for the motor and is located on top of the crank case upper half. The transmission and rear axle are packed in grease and are oil tight. Grease cups of ample size are used wherever necessary on all parts to insure proper lubrication.

CONTROL.

The control is exceedingly simple, everything being taken care of by a single lever operating in an H quadrant. This lever gives both speeds forward, the reverse and also applies the internal expanding brakes on the rear wheels, the car thus being free from a multiplicity of pedals and levers which obstruct the entrance or prevent or make dangerous the use of a lap robe.

IGNITION

Believing that magneto ignition is the highest type, this company has equipped these low-priced cars with that form of ignition, using a two-unit coil on the dash. It is believed that not only will a magneto add to the power of the engine but that it will save in the neighborhood of 20 per cent. in operating expenses. High-grade cable and ignition wiring is used throughout.

BODIES

The body is of standard runabout pattern having a white ash frame, poplar panels, and is substantially constructed throughout. The rear seat is mounted on a removable artillery box. The seats themselves are of three-ply veneer, so constructed that the panels will not split. The artillery box is of good capacity and will hold all necessary tools and still have room for carrying purposes, or this box can be removed entirely, giving a rear platform for commercial or extended touring purposes.

Attention is called by the company to the fact that no radius rods are used and that both the front and rear axles are carried by the springs only, the claim being made that as there are no rigid connections between the axles and frame, the springs absorb all vibration caused by

rough roads, and make the car easy riding. A claim for quiet running is also made owing to the fact that flexible wire cables to the brakes instead of solid rods are used. The bodies are 6 ft. 8 in. in length by 2 ft. 8 in. in width, and have 3 ft. of clearance from the back of the front seat to the rear end of the body. The road clearance is 14 inches. The standard finish is dark carmine body with light carmine running gear. The cars are upholstered in green leather.

Two mufflers are fitted, one for each cylinder, so that there is very little back pressure and the exhaust is almost completely silent.

The cars are equipped with one pair of side oil lamps, tail lamp, horn, assortment of tools, rubber floor mat and rubber covered running boards.

Model A, shown in Fig. 2, with rumble box, rail and cushions, sells for $775, or $760 without the rumble. Model C, surrey type, shown in Fig. 1, sells for $800, and as Model D when fitted with a top for $835. These cars, it is claimed, have a maximum speed of 25 miles per hour, 16 miles being normal.

## READVILLE, MASS., AUTO RACES

The annual track automobile racing meet of the Bay State Automobile Association was held at Readville, Mass., on June 17.

The feature of the day was the breaking of the 25-mile track record in the event for the Harvard trophy, by Ralph De Palma in the Fiat Cyclone. The old record of 23 minutes 38 3-5 seconds was made on December 19, 1904, at Fresno, Cal., by Barney Oldfield.

De Palma's time on the unbanked, circular track was 23 minutes 35 seconds for 25 1 mile laps giving an average of a mile in 56 3-5 seconds. When De Palma finished L. B. Lorimer in a Chalmers-Detroit had an even mile to go.

The summaries are:

For Bailey trophy, five miles, for stock cars, driven by amateurs—Won by B. W. Shaw, Boston, in Stoddard-Dayton car. Time, 5 m. 25 s. Special match race; five miles—Won by Harry F. Grant, Boston, in Alco car. Time, 5 m. 5 1-5 s. For touring cars, 36 H. P. and under, five miles—Won by E. C. Hayes, Boston, in Midland car. Time, 6 m. 4 3-5 s. For stripped stock cars; chassis over 36 H. P.—Won by L. B. Lorimer, Worcester, in Chalmers-Detroit car. Time, 9 m. 46 1-5 s. For stock car roadsters, or runabouts up to 30 H. P.; three miles—Won by John J. Coffey, in Columbia car. Time, 3 m. 38 s. For stock cars, roadsters or runabouts, 31 H. P. and over, five miles—Won by S. L. Rogers, New York, in Welch car. Time, 5 m. 14 s. Open to all, 25 miles—Won by Ralph De Palma, in Fiat car. L. B. Lorimer, Worcester, second in Chalmers-Detroit car. Charles Basle, third, in Buick car. Time, 23 m. 35 s. (world's record)

## MOTOR BOAT RACES

On June 5 four power boats started on a race from Gravesend Bay to Bermuda. They were the "Heather" (58.44 feet, 44.32 horse power), owned by Richmond Levering; the "Insep" (58.6 feet, 4 .. horse power), W. C. Proctor, owner; the "Nereides II" (58.8 feet, 32.39 horse power), F. C. Rogers, owner; and the "Ilys" (50.21 feet, 30.58 horse power), owned by J. G. N. Whitaker. The boats are all trunk cabin cruisers.

Rough weather was encountered all the way and several narrow escapes were reported. The "Heather" allowed the "Insep" 32m. 59s., the "Ilys" 4h. 15m. 53s., and the "Nereides II" 7h. 23m. 24s.

The race was won by the "Heather," the largest and most powerful of the four. The "Ilys" and "Nereides" met with mishaps, which prevented them from making a better showing.

The time of the winning boat, "Heather," was 80 hours, 56 minutes, 18 seconds, which corresponds to an average speed of 8.2 knots or 9.75 statute miles. The "Nereides II" was 91 hours 10 minutes making the trip, and the "Ilys" and "Insep" 96.6 and 97.25 respectively. The "Heather" has a 4-cylinder 6x8 Standard motor and a 3-bladed, 32-inch diameter, 42-inch pitch wheel; "Insep," a sister craft, a 6-cylinder 6¼x8 Jager motor and 3-bladed 38x38 propeller; "Nereides II," a 4-cylinder 6½x8 Sterling engine and 3-bladed 35x40 propeller, and "Ilys" a 5½x6¼ 4-cylinder Hall motor and a 24x26 3-bladed wheel. All the engines are of the 4-cycle type.

The Cresent A. C. offered a cup as a prize to the winner of the return race from Bermuda to New York. Bad weather and heavy seas were also experienced on the return race, which was won by the "Ilys," owned by J. G. N. Whitaker. The race was started at 10 09 o'clock June 14 and the "Ilys" finished at 5.32 50 on June 17. The time for the 670-mile trip was 78 hours, 43 minutes and 50 seconds. The "Heather" finished second, just 1 hour, 22 minutes and 44 seconds astern of the winner. The "Insep" finished June 18th, at 3.08.45.

## Q. C. M. C. RUN TO PITTSBURG

Clayton S. Carris, driving a six cylinder Franklin, won the Quaker City Motor Club's five day endurance contest with a perfect score. The contestants started from Philadelphia on June 14 and drove to Pittsburg and back to Philadelphia, arriving there on the afternoon of the 18th. Walter M. Cram, driving a Mitchell in Class B for cars that sell for $2,000 or less, arrived about two hours after Carris. Cram had a perfect score up to the last day of the contest, but lost a few points for changing a spark plug, which was the nearest to trouble he came. W. E. Sautleworth, a New York amateur who drove his own Haynes runabout in Class C, also checked in on the 18th. The stormy weather made fast driving dangerous and several had accidents which caused them to lose time.

# INTER STATE CAR

All the most important features of the 1909 Inter-State Models made by the Inter-State Automobile Company, of Muncie, Ind., have been retained in the 1910 Models. With the necessary refinements of detail added to an increased wheel base and larger cylinder bore, an improved type of clutch, a three-quarter elliptic rear spring suspension and more room in all styles of bodies Nothing has been omitted which it was believed could give better results as to reliable running qualities, graceful appearance and economical up keep, all features which have been accepted universally as possessing exceptional merit.

MOTOR CHANGES AND IMPROVEMENTS.

The motor changes are an increase of the cylinder bore, a larger cam shaft, the adoption of hardened and ground steel rolls in the push rods, giving frictionless rolling contact on the cams, a water pump case integral with crank case, and a rotary gear oil pump on the outside of the crank case. The four vertical cylinders with integral water jackets and cast in pairs are given a high hydraulic test both before and after machining to discover any unseen sand spots or flaws. The bores are ground to exact dimensions as well as the pistons and rings and the latter are ground on the sides, assuring interchangeability. All are made of the finest gray iron. All of the valves are located on one side with hardened and ground nickel steel heads and ground stems, and both valves and passages are of large diameter, giving a high efficiency in power production. Valves are operated by a large single piece cam shaft, hardened, and ground mechanically correct from generated master cams. The push rods contain hardened and ground steel rolls giving rolling contact on cams, and eliminating all sliding contact on the cams. The whole construction assures a smooth, positive and noiseless action.

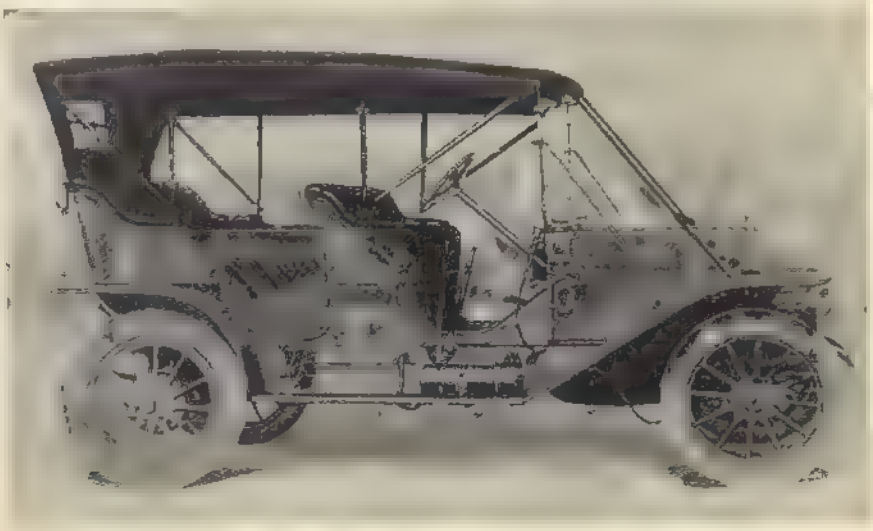


Fig 1. 1910 Interstate "35-40" touring car, model 35, motor 4 cylinders 6½ by 5, jump spark ignition, two complete systems, U. & H. magneto and storage battery, multiple disc clutch, selective change speed gear, shaft drive wheel base 138 inches, tires 34 by 4. Price $4,750. This view shows the car with complete equipment.

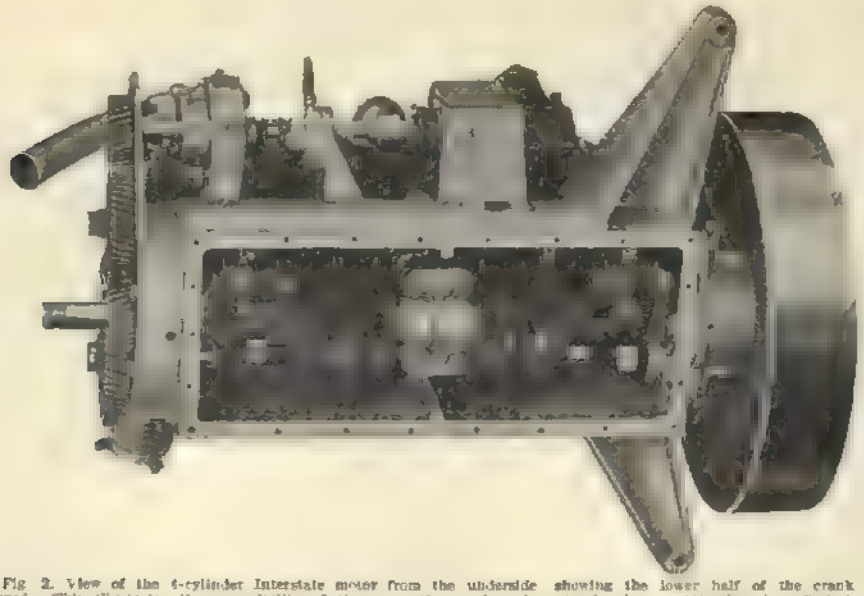


Fig. 2. View of the 4-cylinder Interstate motor from the underside showing the lower half of the crank case removed. This illustrates the accessibility of the connecting rod and main bearings. Attention is called to the careful locking of all nuts and bolts and to the spiral quiet running gears at the forward end of the case. The cylinder bore has been increased to 4½ inches, cam shaft is larger than last year and hardened and ground steel rollers are now fitted to the bush rod ends. Cylinders are cast in pairs and the motor is mounted on a three point suspension. All cylinders are hydraulically tested for porosity or leaks.

The crank shaft is made for a special carbon steel forging, double heat treated, and all bearing surfaces are ground to exact size. It is supported by three large main bearings, the center bearing support being integral with the crank case and the rear and center bearings are adjustable for any possible wear. All bearings are of high-grade bearing metal, which in connection with the efficient lubricating system, assures long life under severe conditions.

LUBRICATION.

The crank case is a high grade aluminum casting, accurately machined by the use of various jigs, and the oil reservoir is bolted directly to the bottom of it. This is easily removed for adjustment or inspection of the cam shaft, crank shaft, connecting rods or push pin rollers, and gives unusual accessibility, yet gives a very rigid crank case. The lubrication is accomplished by the constant level splash system with a sight feed indicator of latest type on the dash, indicating the flow of oil at all times from the reservoir to the crank case. The constant level is maintained by a rotary gear oil pump located on the side of crank case and driven by the water pump shaft. The oil reservoir holds two gallons and receives the return from the crank case by gravity.

Motor cooling is effected by a fan cooled radiator of latest type and a fan fly

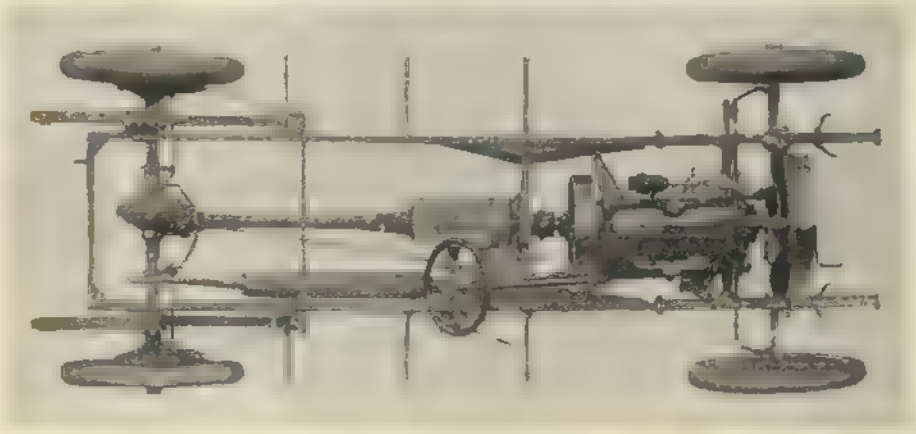


Fig. 3. Plan view of the 1910 Interstate chassis illustrating the arrangement of the engine, transmission and rear axle assembly. The engine is carried on a three point suspension, its forward end being flexibly mounted on a cross frame member while the rear end is supported by two integral crank case arms resting on the strongly webbed frame. The central cross frame member carries the forward end of the flange steel gear case which is in integral assembly with the propeller shaft housing. Attention is called to the brake pull rods and cranks.

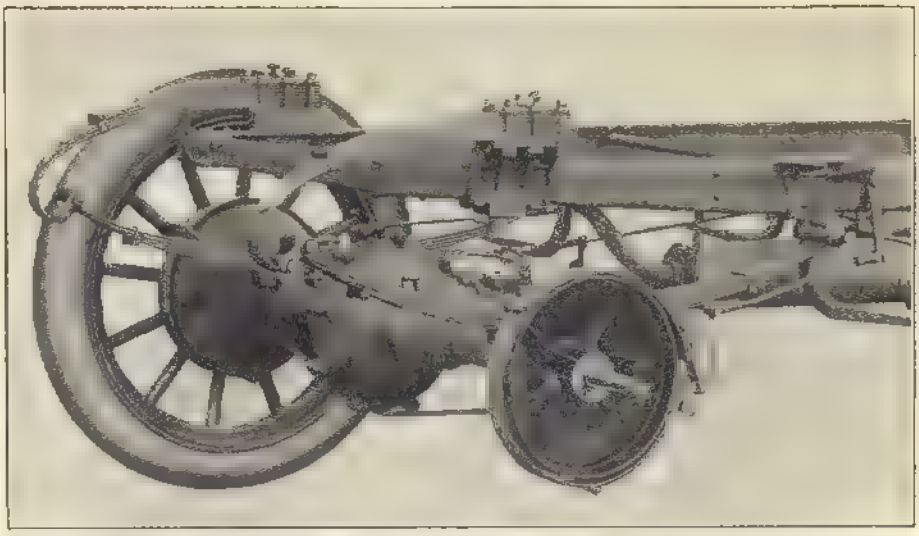


Fig. 4. Rear of the Interstate chassis showing one wheel removed. The rear springs as shown are of the three quarter elliptic type with scroll ends and are fastened to the frame by means of special brackets which carry a rubber bumper on the under side.

wheel. A positive system of water circulation is maintained by a gear driven centrifugal pump, the case of which is integral with the crank case. Radiator cooling is by a ball bearing fan supported from the motor and driven by a flat belt from the crank shaft.

MAGNETO AND BATTERY IGNITION

The ignition system consists of two separate and distinct modes with a separate set of plugs for each system. The batteries, four unit coil, timer and set of spark plugs is the first, and the second is a U & H imported high tension magneto with a separate set of spark plugs. The magneto is mounted on a standard of the crank case and is directly connected to the pump shaft by an improved Oldham coupling. The pump shaft is gear driven by a helical gear meshing with a helical cam shaft gear and all gears are covered with an oil tight case. The entire timing gears are of helical or spiral type and represent the highest type of high speed gearing known, where smooth and noiseless action is required.

The gasoline fuel is supplied by gravity from a tank of large capacity and assures sufficient pressure on any grade likely to be encountered. The carburetor is of the latest float feed type having a visible gasoline level and easy and positive adjustment. It is automatic in its action and provides the proper mixture for all motor speeds. The throttle valve is controlled by a hand lever on the steering wheel and by an accelerator pedal conveniently located

The drive is taken from the motor by a double universal joint of improved design, which can be disconnected without disturbing either the motor or transmission and is practically noiseless and easily lubricated.

IMPROVED CLUTCH

An improved form of multiple disc clutch is used comprising 63 plates of tempered saw blade steel running in a

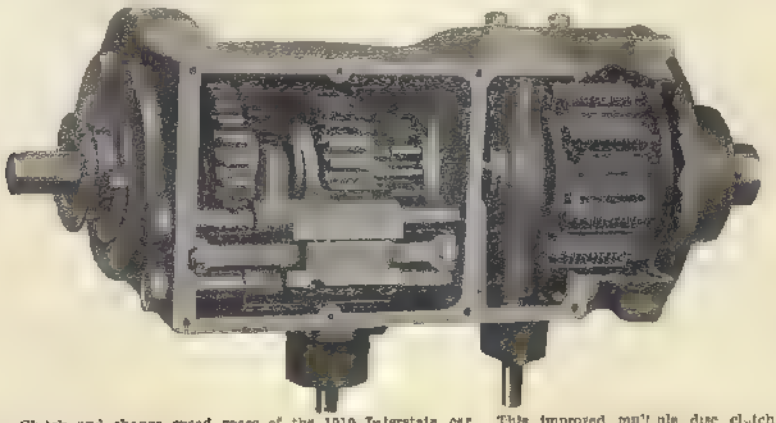


Fig. 5. Clutch and change speed gears of the 1910 Interstate car. This improved multiple disc clutch contains 63 steel discs and runs in oil in a separate compartment from the change gears. Compression is maintained by 6 spiral springs as shown. The shafts are mounted on annular imported ball bearings. The gears are of vanadium steel five pitch and of extra wide face.

separate compartment integral with the transmission case. The large number of steel plates gives the same smooth positive action as from the use of bronze and yet has not the fast wearing features of the bronze discs. A ball thrust bearing between the yoke collar and the clutch throwout-yoke ring eliminates a large amount of friction and consequent wear The clutch complete gives a smooth positive action at all times and the qualities

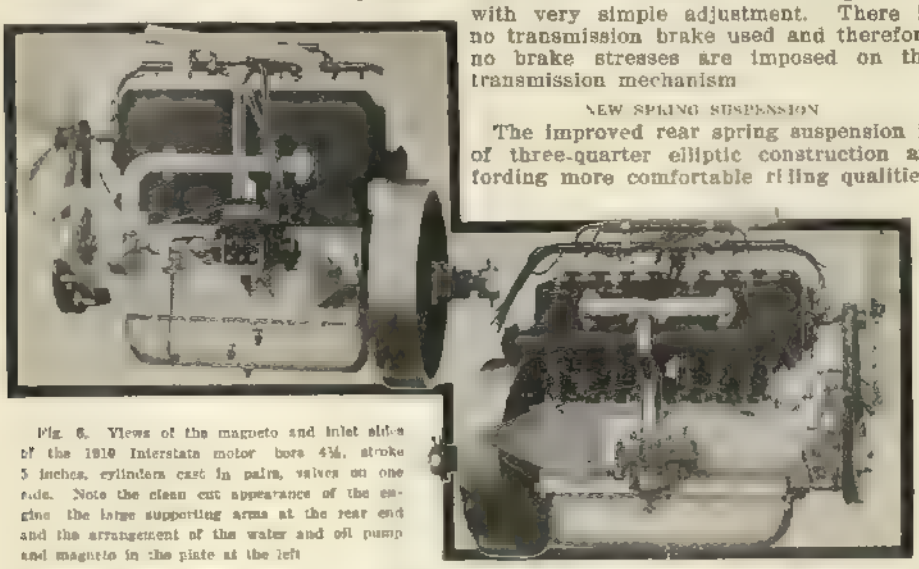


Fig. 6. Views of the magneto and inlet side of the 1910 Interstate motor bore 4½, stroke 5 inches, cylinders cast in pairs, valves on one side. Note the clean cut appearance of the engine the large supporting arms at the rear end and the arrangement of the water and oil pump and magneto in the plate at the left

described assure long life. Six spiral springs evenly spaced outside of the discs, force the plates into intimate contact, giving a very even thrust on the clutch discs and not depending upon the action of a single spring. This construction makes it impossible for the clutch to fail owing to a single weakened spring.

THE CHANGE GEARS

The Inter-State transmission is a durable construction and has great ease of operation. The case is a high grade aluminum casting and the shafts are supported throughout on imported annular bearings

All gears are of extra wide face and heavy pitch—five pitch being used throughout—and all gears not in constant mesh are made of Vanadium steel. The sliding gears shift on the four keyed type of shaft and the keys are integral with the shaft. All gears are hardened and ground, and chamfered with the most improved form of curve. A double locking device holds the gears and shifting lever in position and prevents going by neutral position unintentionally.

The propeller shaft is rigidly supported at both ends and the bevel drive pinion and gear and differential box are housed in an oil-tight differential case. All bevel gear teeth are carefully generated assuring noiseless and efficient power transmission and all the gears are easily removable. The axle shafts are of large dimensions, and made of very carefully selected steel. The rear axle is equipped with the latest type of internal and external brakes. The two internal expanding brakes are used as service brakes. These are operated by pedals and are dust proof. All brake bands are lined with 2-inch Thermoid and are provided with very simple adjustment. There is no transmission brake used and therefore no brake stresses are imposed on the transmission mechanism

NEW SPRING SUSPENSION

The improved rear spring suspension is of three-quarter elliptic construction affording more comfortable riding qualities. They are very rigidly suspended outside of the frame side rails and the wide spring base gives a more easy riding action of the car on rough roads. The rear springs are 45 inches long and the front springs 42 inches. All are 2 inches wide and made of Vanadium steel.

The front axle is made of a high carbon steel drop forging properly heat treated and of I beam construction. The steering knuckles are provided with extra large ball bearings fully ground and eleven connections are fitted with grease cups. The front axle road clearance is 11 inches and the rear axle clearance is 10 inches. The steel mud apron under the motor has a road clearance of 11 inches. The 1910 price is $1750.

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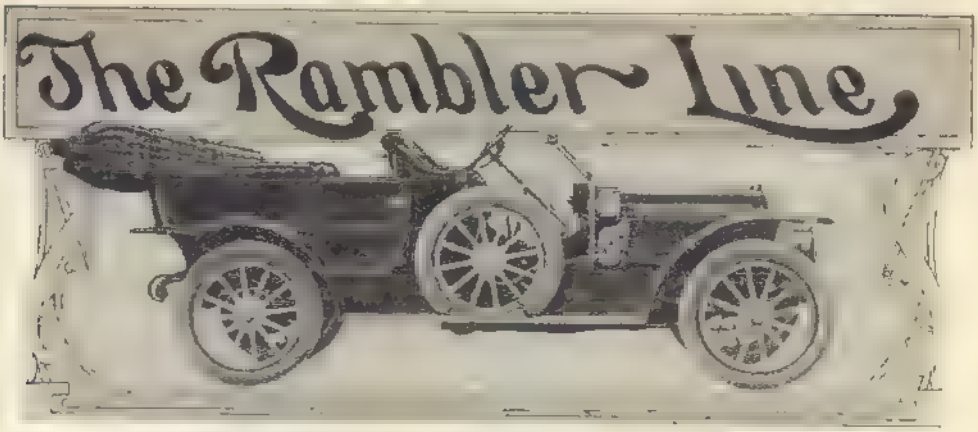
**The 1910 Philadelphia Show** of the Automobile Trade Association will be held during the week of January 17, in the Second Regiment Armory, Broad and Susquehanna avenue.

**Chauffeurs Organize** — Chauffeurs of Washington, D. C., have organized a Chauffeurs' Protective Association and affiliated as a union with the Knights of Labor. The new organization's policy will be to expel from its ranks any chauffeur convicted of joy riding.




There are five models of the "New Rambler" built by Thomas B. Jeffery & Company, Kenosha, Wis., all based upon three different chassis, all with four cylinder engines, magnetos and 36 inch wheels

Model Fifty-five, seven passenger touring car $2,500, seven passenger limousine $3,750; Model Fifty four, five passenger touring car or four passenger close coupled $2,250; and model Fifty three, five passenger touring car $1 800

In design and materials the engine, transmission, drive shaft, axles, frame and wheels, are alike for all three chassis. In these particulars they differ in size only

Those individual Rambler features of the past such as the offset crank shaft, big wheels, spare wheel, straight line drive and engine accessibility, are found in all three chassis

Two of the chassis which differ only in wheel base and tire size have engines 5 by 5½, which deliver 45 H. P.

Model Fifty five, the seven passenger touring car, has a 45 H. P. engine, 123 inch wheel base, 36 inch wheels and 4½ inch tires. This model complete with magneto, gas lamps and Prest O-Lite tank, electric side and tail lamps and 6 80 storage battery, sells at $2,500

The same chassis with 5-inch tires is used for the seven passenger limousine.

Model Fifty-four is provided as a five passenger touring car, or four passenger close coupled, and sells at $2,250, with the same equipment as provided on Model Fifty-five. It has the 45 H P engine, 117 inch wheel base, 36-inch wheels and 4 inch tires.

Model Fifty-three is another five passenger touring car This is almost a duplicate of Model Forty-four of last year The cylinders are 4½ by 4½ and deliver 34 H. P. This model with magneto and lamp equipment sells at $1,800

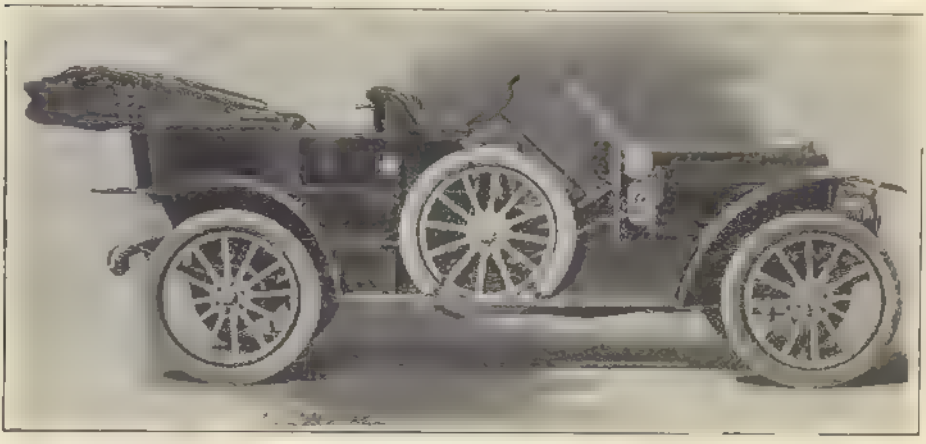


Fig. 1. The New Rambler Model 54 Touring Car. This car has a 4-cylinder motor 5 by 5½, rated as 45 H. P. Ignition is by jump spark with two systems, high grade magneto and storage battery using a single set of coils. Internal expanding clutch. Three speed and reverse sliding gear transmission. Two sets of gases, 1 7-in wheel base 36 by 4-in tires on quick detachable rims, tread 56 in. or 60 in. Equipment, electric side lamps, combination oil and gas tail lamp, gas head lights, Prest-O-Lite tank or generator, horn, full tool equipment and jack. Price $2,250

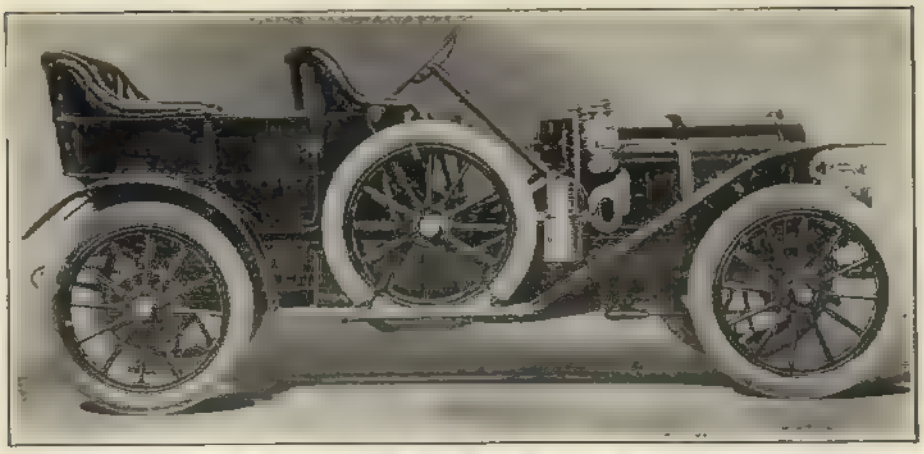


Fig. 2. The New Rambler Model Fifty-five. Equipped with Bosch magneto, gasoline lighting and battery ignition, 120-inch wheel base, 36 by 4 inch tires with detachable rims, sliding gear transmission of selective operation, passenger body, electric lights, side and tail lamps, gas head lights and generator, horn, full set of tools and jack.

As the differences have been explained above the following description will apply to both Models Fifty five and Fifty four.

THE RAMBLER MOTOR

The engine, as the photograph shows, is of the same type that has been used in models Forty-four and Thirty-four Ramblers of the past two seasons. The valves overhang all on one side, and the crank shaft is offset 25 per cent. of the piston stroke. The crank case is of the barrel type with an opening 23 by 8 inches on the side for inspection and adjustment. A wedge type of bearing, adjustable from the side, as shown in Fig. 5, makes possible easier and more perfect adjustment from the side than can be accomplished by the bolt method

In the 1910 model the pump has been moved to a position forward of the cam gear case. This change is to provide for a more accessible magneto location. It is now located on an extension of the pump shaft just back of the cam gears. It can be very easily reached for both inspection and adjustment.

A combined shield and oil gutter attached to the crank case at the rear of the fly-wheel end main bearing returns all surplus oil that may work through this bearing back to the crank case. This eliminates the possibility of its dropping on to the fly-wheel and being thrown on to the other mechanism.

THE EXPANDING CLUTCH

In Models Fifty-five and Fifty four chassis the clutch has been changed from the cone type to the internal expanding type. This eliminates end thrust on the crank shaft and its design is such that it exerts the greatest pressure when fully

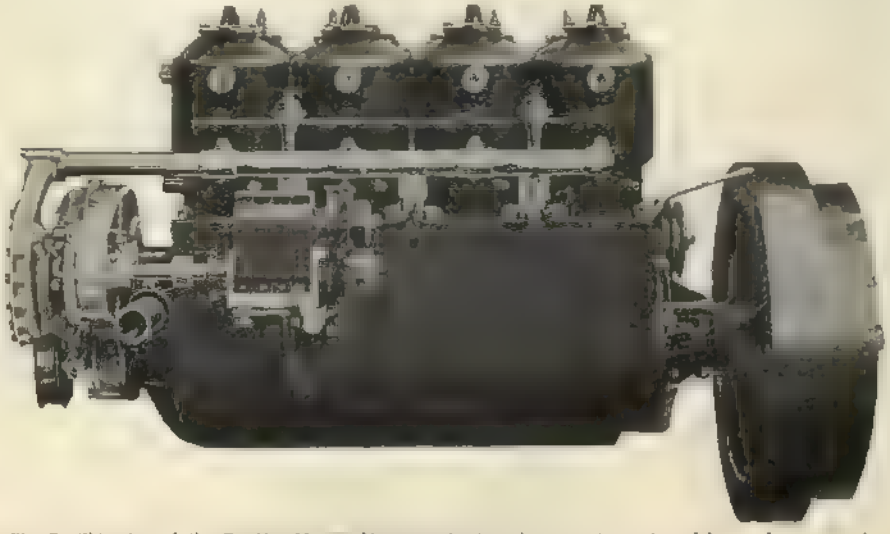


Fig. 3. Side view of the Rambler 55 and 54 engine showing the magneto, water piping and pump and the method of marking the fly wheel to certificate valve setting

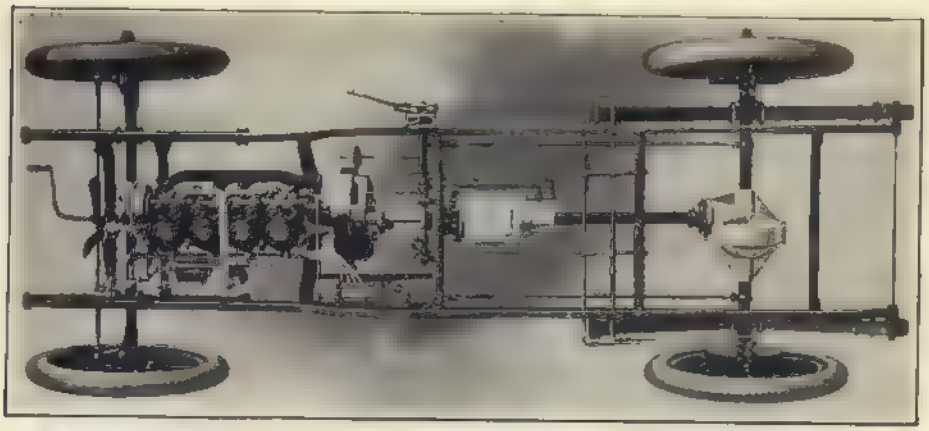


Fig. 4. Plan view of the Rambler 54 chassis showing clearly the method of mounting the 4-cylinder engine on the two cross frame members, the location of the multiple vertical roller and its belt drive from the cam shaft and the arrangement of the rear axle assembly distance rods and change speed gear case and also the large semi-elliptic rear springs.

engaged. With the average clutch the spring is expanded when the clutch is engaged so that it then exerts the least instead of maximum pressure. This clutch has been very thoroughly tested and it is claimed has been found to be ideal in operation, that is, it engages very gradually, holds positively, and disengages instantly.

Fig. 5. Detail view of the wedge type adjustable main bearings which are now fitted to the 1911 Rambler. These bearings make adjustment from the outside a simple matter, as tightening two nuts forces a wedge shaped piece against the bearing boxes, bringing them tightly together and thus taking up the wear.

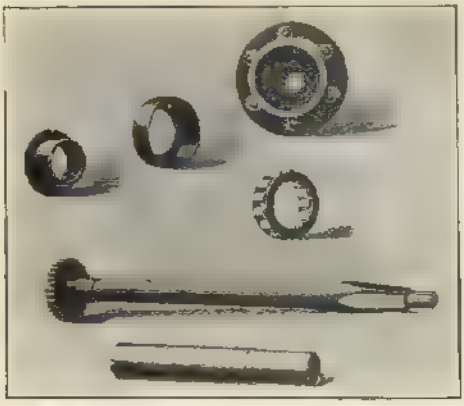
The only change in the transmission is at the roller bearing which carries the forward end of the main drive shaft. This is a hinged bearing with a dowel fastening, retained in a steel case and provided with adequate means to compensate for all end thrust.

The rear axle continues of the semi floating type but the drive shafts are larger and a new method is used for securing the wheels. On the Rambler drive shafts the differential gear is upset on the end of the shaft, making the drive gear and axle integral. In the 1910 models the wheel end of the shaft is also upset. This enlarged end is squared and tapered for the forged wheel hub. This method of upsetting or enlarging the shaft before squaring it, makes it strongest at this point, whereas otherwise the metal removed by squaring would weaken it.

The springs are of the triple action type, but somewhat modified in design from those of last year. They are straighter and the second leaf is longer, extending into the bend of the top leaf so as to support it.

The screw and nut type of steering gear has ben retained but the nut has been lengthened to increase the wearing surface, and a ball thrust bearing has been added with better provision for adjustment.

A neat pressed steel bracket supports the bonnet at the dash. The strap is done away with and the bonnet is held down by convenient spring clamps. Particular attention has been paid to the guards; they are wider, heavier, better braced, convexed to strengthen them and improve the appearance, and their outline is much more graceful. The front guard follows the radius of the wheel, while the rear guard extends straight back with the body lines.



Rear axle shaft roller bearing sleeve and cast as used in models fifty five fifty four and fifty three for 1910. The differential gear is made integral with the shaft for a portion of its length and tapered and taper squaring to take the forged wheel hub. By enlarging the shaft at this point it is not weakened when squared.

A neat filler strip projects from nearly the top of the frame to the running board, entirely covering the running board supports. Four of these supports are provided for the larger and wider running board now used. This board is aluminum covered.

BODY CHANGES

The changes in the bodies apply alike to both models. The most important change is the lowering of the seats. This adds to the comfort of the passengers and improves the appearance. More room is provided between the front seat and the pedals.

The tonneau floor is counter sunk between the frame channels, providing plenty of room even with the lowered seat. Above the frame channels the tonneau is widened. In the seven passenger car ample room is provided to pass between the two extra chairs when occupied. These bodies are very richly upholstered with hand buffed leather, curled hair and deep springs. Deeper springs and more and better hair are used than heretofore, adding greatly to the riding qualities.

Although Model Fifty three is a smaller car, it can hardly be called a small car, particularly in power. With 4½ by 4½ cylinders the engine delivers 34 actual H P by dynamometer test. The performance of this model is even better than its predecessors, because the car otherwise is somewhat smaller and lighter. The wheel base is 108 inches; the wheels 36 inches, with front tires 3½ inches and rear tires 4 inches if desired, at $20 extra.

The description of Models Fifty-five and Fifty-four, relating to the pump and magneto locations, the oil shield and gutter, transmission bearing and rear axle, apply also to this model.

Practically the only other important change from its predecessor is in the rear springs. They are the full elliptic type with involute ends. These springs have been used for two seasons on other Rambler models, and have so thoroughly demonstrated qualities of unusual comfort as to warrant their adoption for this model

Model Fifty-three is so nearly like its predecessors, Model Forty-four and Thirty four, that a detailed description is not necessary.

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The Detroit Seamless Steel Tubes Co., Detroit, Mich., is now erecting a large addition to their factory, and installing additional equipment which will increase their capacity about 30 per cent.

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**General Motors Co. Increases Capital**—The General Motors Company, which now controls about twelve companies, recently increased its capital stock from five million five hundred thousand dollars to forty million dollars

**H. C. Henderson**, who has been connected with the Thomas factory, Buffalo, New York, for a number of years, has joined the selling forces of the E. R. Thomas Motor Branch Company in Boston. He has the best wishes of many old customers and factory employees who know him as "modest Barney."

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**The Union Machine Works**, 1411 North Tenth street, St. Louis, Mo., have been appointed general sales agents for the "Anderson" engine in St Louis and vicinity.

The above cut illustrates the recent addition made by the Speedwell Motor Car Co., of Dayton, Ohio to their already large plant. This building, of steel and brick with cement floor, will be occupied by the Upholstering and Painting Departments which have been sorely cramped for room. Another building equal in size to the one shown above is contracted for and will soon be erected.

The 1910 model of the Regal 30 is a continuation of the 1909, the difference consisting only in some minor changes, not affecting the principals of construction, but adding little points for the convenience of the user, or for the improved operation of the car.

The motor is still a 4x4, valves on one side, with leather faced cone clutch, enclosed grease tight universal joints, and with the three speed selective transmission located on the rear axle.

The wheel base has been lengthened two inches, making it 107 inches. The body has been made a little roomier and with better lines, and this together with the curved dash and new fenders gives the car a somewhat different and improved appearance.

ENGINE REFINEMENTS

The engine has been refined in several particulars. The pistons now are equipped with three rings above the piston pin and one below, thus making an additional precaution against compression, leakage, and serving to keep an excess of oil from getting past the piston, if at any time too much of the lubricant should be poured into the case by a careless user. A pressed metal float has been provided in the lower case which indicates the height of the oil by means of a stem which extends from the float up through a glass tube located on the upper crank case. As this tube is air tight and the oil never gets into it, it is always clean and the stem is easily seen. Any sight tube that contains oil will very soon become dirty and make it almost impossible to determine the level.

The fan has been removed from the radiator and is now placed on an adjustable bracket attached to the cylinders and braced by the lower crank case. This fan, equipped with ball bearings, is driven with a "V" belt, and needs oiling only once or twice a season

A gear pump is provided as formerly, except that the housing of the pump is

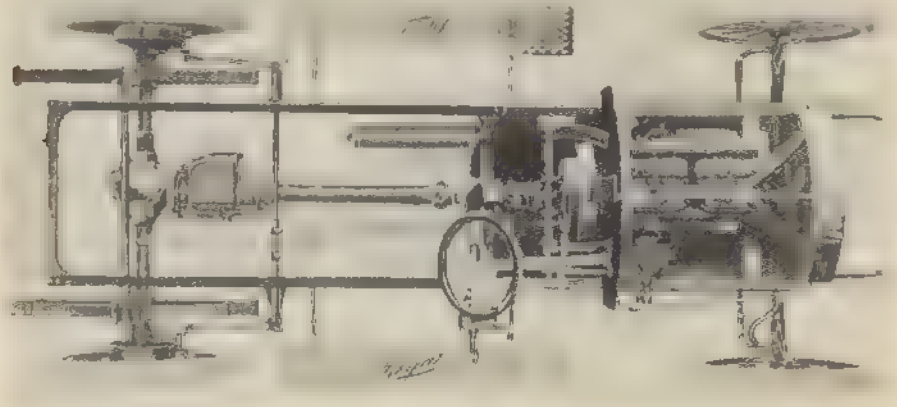


Fig. 1. Plan view of the Regal chassis showing the transmission rear axle assembly, the scroll ends, full, rear springs and the cross bar to which they are pivoted this additional member giving considerable strength to the frame. The arrangements of the brake rods and the brake sectors is also clearly shown. The forward end of the propeller shaft is pivotally mounted on a ball and socket joint on a cross frame member which transmits the propulsive effect to the frame entirely relieving the springs of this duty

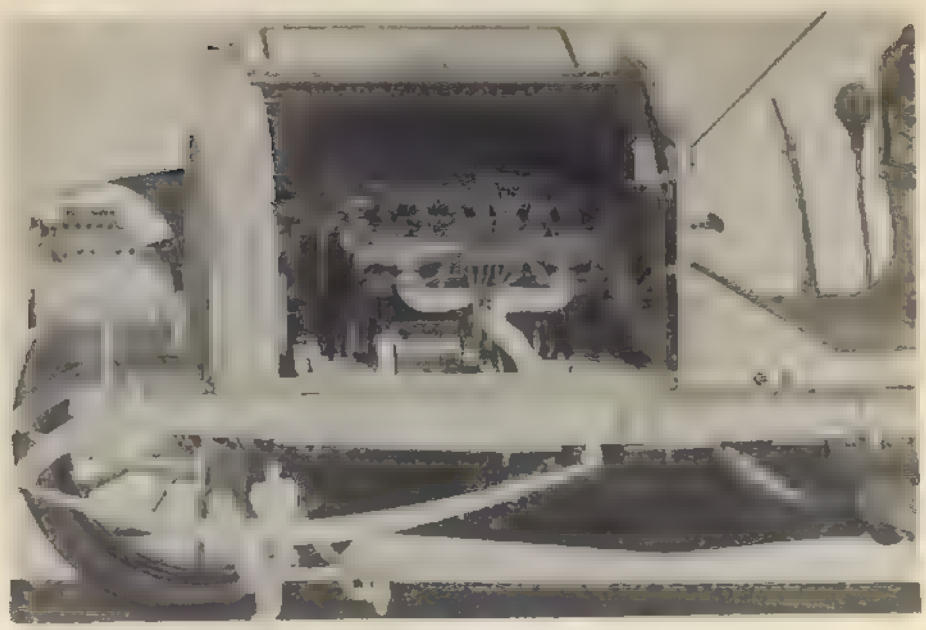


Fig. 2. Forward end of the 1910 Regal chassis showing the arrangement of the engine and the long front semi-elliptic springs upon which the axle is practically suspended by means of the center [illegible]

made in one solid piece, thus saving about one-half the weight and doing away with the possibilities of a leak at the union of the two castings.

A long cylindrical strainer is provided at the intake, and the oil is discharged through a steel tube on to the main bearings. An overflow returns the oil to the reservoir which holds about a gallon and a half.

A breather pipe, about twice the capacity of the old one, has been provided, which not only effectively releases any crank case pressure, but also provides a very easy means of filling the oil tank. A baffle is provided in this breather pipe which effectively prevents the smallest particle of oil from being thrown out.

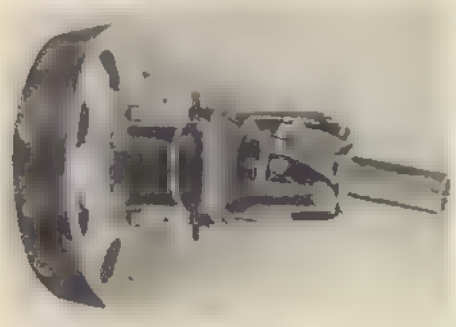


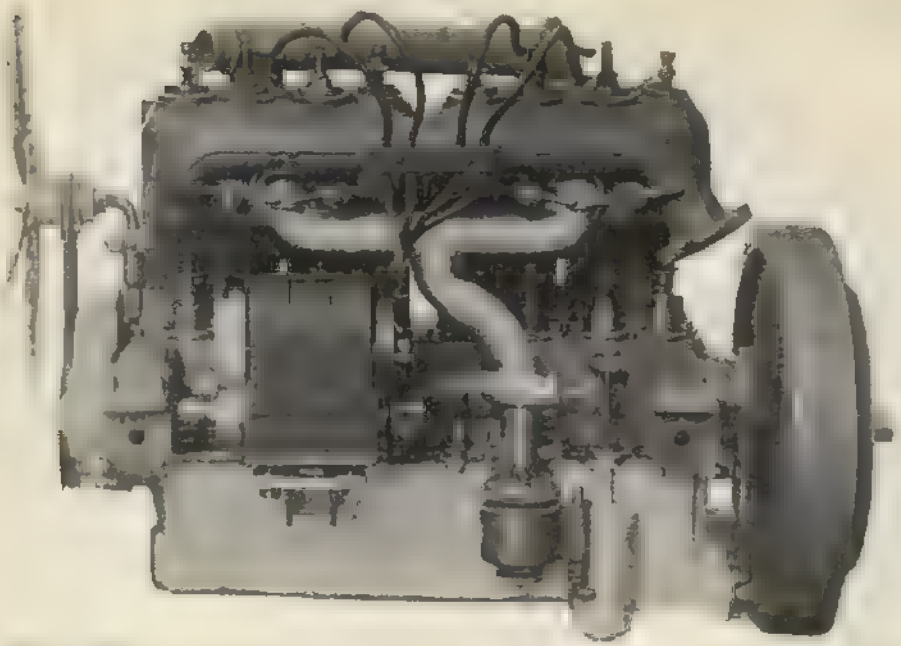
Fig. 3. The Regal leather faced cone clutch fitted with cork inserts as used in the 1910 models. To the rear of this clutch is an efficient universal joint as shown

KND ADJUSTMENT OF CAM SHAFT

If a cam shaft has but a very slight end play in its bushing, it will cause a knock, and is sometimes very hard to locate. To guard against this trouble, the rear end bushing is threaded so that it may be pushed backward or forward to give an exact fit between either end of the cam shaft flanges; slots being provided in the bushing by means of which a dowel pin holds it in place.

THE AND SYPTION COOLING

The cooling system on the Regal is thermo-syphon and it is claimed has proven so successful that not a single complaint has been received on the whole year's output. If as in some systems the pipe extends from the engine to the top tank of the radiator, a slight lowering in the water level might leave an open spot in the system so that the water will not circulate except in spurts when enough steam has been generated to push the water over the intervening space. To overcome this difficulty, the pipes have been lowered so that they rise on a slightly inclined line which permits the water level dropping to a much greater extent before the circuit is broken. Now, should this central tank extend entirely through the radiator, there would be a hot stream of water tending to rise, which upon cooling tends to drop through the same tube, thus giving two forces working in opposite directions. In the Regal system, however, the tank extends only half way through the radiator so that the hot water rises at the rear, becomes cooled, and descends through the front of the radiator so that there is an uninterrupted flow. To further facilitate the circulation, a two inch



[illegible] the valve side of the 1910 Regal motor, cylinders 4 by 4. Attention is called to the simple [illegible] water pipe, the method of holding the exhaust and inlet manifolds by yokes, a special bracket for [illegible] and its drive through an Oldham coupling from the half time gears, and the arrangements of the [illegible] ting system, with gauge glass as described in the text

pipe is used at the bottom and two 1½ inch pipes at the top, which together with the free passage through the water jackets allow an uninterrupted flow, which is necessary in a successful thermo-syphon system.

The leather faced cone clutch has proven so satisfactory that no changes have been made This applies also to the universal joint in the ball end of the propeller tube

The transmission located on the rear axle has been improved by the use through out of high duty nickel steel Hyatt bearings. All these bearings are incased in solid, hardened and ground bushings, and run upon hardened and ground ends of the shaft itself. Thorough and exhaustive tests have proven this transmission to

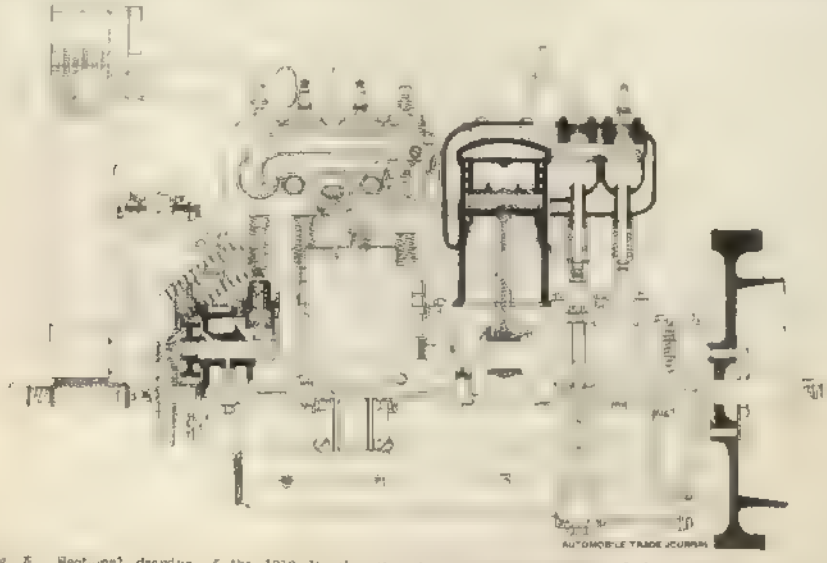



Fig 8. Sectional drawing of the 1910 Regal motor showing [illegible] cent of the 3 Lidon rings, valves with [illegible] stems, well filleted under the head and details of the valve [illegible] gs cup washers, and retaining pins [illegible] ens over the valves with spark plug and priming cocks [illegible] lso the [illegible] arrangement for operating cam and the [illegible] water pipe for thermal circulation

be highly efficient and one that will stand perhaps the most abuse of any construction possible

The shafts and gears are all of nickel steel; the gears being cut with teeth specially constructed for strength at their base. The diameter of the rear axle tubes has been increased from 2 to 2½ inches, thus giving a construction even more rigid than its predecessor, and to further improve this member, the axle shafts are also being made of nickel steel

The most frequent cause of noisy gears in the rear axle is the lack of adjustment for the driving pinion and bevel gear which is attached to the differential. On many cars, there is no adjustment in either case, but this construction is fitted with an adjusting collar which will move the small bevel pinion back and forth, while two other adjusting collars are found in the rear axle which will move the large bevel gear in either direction, so that it is possible to accurately adjust these gears for noiseless operation. This is a construction found generally in high priced cars only.

The lines of the body have been improved by the slanting of the seat backs slightly more toward the rear, making one straight line along the arms of the seats and the top of the door, and by making a plain door without a break at the middle

The seats and the doors are made of sheet metal while the material of the under body as heretofore is wood. More clearance has been given between the wheel and the fenders, and the dash has been curved at the top to follow more closely the top of the bonnet.

This year's models include full lamp equipment and generator, as well as a Remy magneto, horn and cutout on muffler

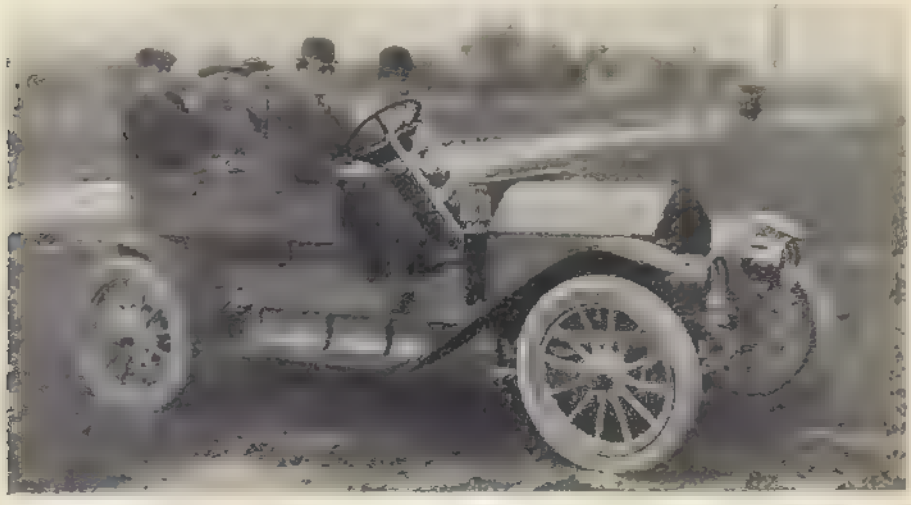
# The Great Western "30"

The Great Western Automobile Company, of Peru, Indiana, has planned for an output of 1,500 cars for the season of 1910. It is said that more than three-quarters of this output has so far been contracted for and deliveries have just commenced.

This concern is making rather rapid strides at the present time, and has been manufacturing cars on a conservative basis under the name of the Model Automobile Company, which name, however has been changed recently, in order to avoid the confusion which has arisen in the past on account of the Model Company building Great Western cars. This company will center their manufacturing efforts principally on the Model 30, a description of which follows:

The cylinders are of the best grade of close grained grey iron, cast in dry sand molds which are baked the same as cores are baked before castings are made. This insures uniform metal throughout. The cylinders are bored to a diameter a trifle smaller than the finished size. They are then aged in order to let them obtain their normal shape after which they are placed in a jig and ground to absolute measurement. The cylinders are ground in the inside clear to their ends and the heads are machined in order to lessen the accumulation of carbon.

All parts are absolutely interchangeable. The water jacket is large and properly proportioned. All pistons are ground to very accurate measurements and are



The Great Western "30" 4-cylinder, four cycle water-cooled motor, cylinders cast separately, 4¼ [illegible] stroke; sliding gear selective transmission; 56 or 60 inch tread, 112 inch wheel base; body to [illegible] magneto, five lamps, generator, tool box, robe rail, horn [illegible] set of tools and repair kit. Price $[illegible]

shown in the illustration, has a very racy appearance and is surmounted by a 14 inch steering wheel. The hood is a one piece construction giving an outline which harmonizes well with the rest of the car. This hood is 25 inches in length. The fenders are long and rakish with aprons to protect the car and passengers. The machine, it is claimed, will make a speed of 75 miles an hour, maximum. The regular equipment consists of two side oil lamps, tail lamp, horn and magneto. A detailed description will be given later in these columns

# Thomas Flyer Model "M" 1910 Model

To anyone who has any doubts regarding the efficiency of the long-stroke motor a glance at the new 1910 Thomas Little S.x, which is to be officially known as the Model "M", and a brief ride behind its wheel will be a convincing proof that the predicted possibilities stirred up by the "Four Inch Race" in Europe are not without just foundation.

Mr. E. R. Thomas, of the E. R. Thomas Motor Co., Buffalo, N. Y., recently returned from a five months' trip through Europe thoroughly convinced from his inspection

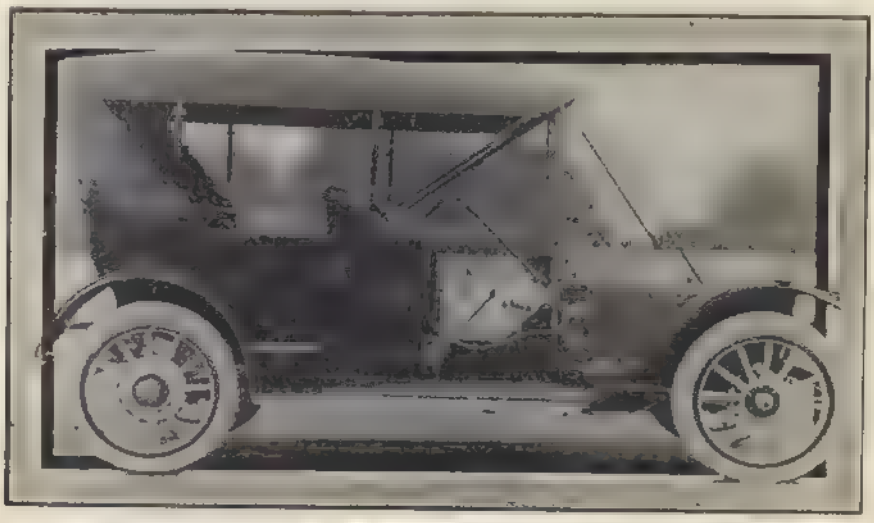


Fig. 1. 1910 Thomas Flyer Model M. [illegible] latest production of the Thomas plant. The [illegible] 4 [illegible] cylinder, cast in pairs long [illegible] arms and large [illegible] three disc clutch [illegible] gears of nickel steel. Timken rear [illegible] Bosch mag and [illegible] tires. Price fully equipped $7,500

of the foreign factories that the most important new feature for 1910 will be the long-stroke motor

By the long stroke motor is meant one in which the travel of the piston is greater than the diameter of the cylinder.

The long-stroke motor does not have to revolve so fast to deliver its power, and will consequently wear longer

For example, to drive a car 30 miles an hour, the Model "M" long-stroke motor makes 840 revolutions per minute, while a motor with 4-inch stroke, to give the same power would have to turn 1155 times per minute.

The long-stroke motor, however, costs more to manufacture since the cylinders are longer, the connecting rods are longer and the crank case is much larger in diameter.

The liberal policy of the Thomas factory is shown by the fact that $3,500, the purchase price for the factory's newest product, known as the Model "M", includes an equipment, which it is claimed, is not exceeded by any other high priced car on the market

The equipment consists of top, glass front, speedometer, horn, headlights and Prest-o-lite tank, two oil side lights and tail lights, robe rail, two complete ignition systems, the Bosch magneto and Atwater-Kent Unisparker and other mechanical features not usually included

This car is made with six types of bodies, including a touring car, runabout, tourabout, flyabout, landaulet and limousine. The open bodies are finished in Royal Blue with straw colored running gear, or Thomas Red with bright red running gear; while the closed bodies are painted a dark maroon color and upholstered with French gray worsted.

The bodies are of hand-hammered aluminum, claimed to be the very highest quality and are luxuriously upholstered with the best grade leather and hair.

The seating capacity of the touring ca. is five passengers. The wheel base is 125 inches and the tread is standard 56 inches

THE MODEL M MOTOR

The motor is a 6-cylinder, 4-cycle, water cooled type, with 4½-inch bore and 5½-inch stroke. The cylinders are cast in pairs and exceedingly well water jacketed In the designing of the Model "M" motor, advantage has been taken of the very latest foreign practice regarding smooth gas passages and large valves. The actua. diameter of the opening, in the clear being 52.6 square inches, which is about 20 per cent greater than ordinary practice

The bearings on the cam shaft of special bearing bronze, give support almost to the point where the cams themselves are attached. Each cam shaft has bearings of 11.3 square inches projected area.

Plain bearings are used throughout the motor.

Die cast bushing of a high grade of babbitt are used on the crank shaft and on the big ends of the connecting rod.

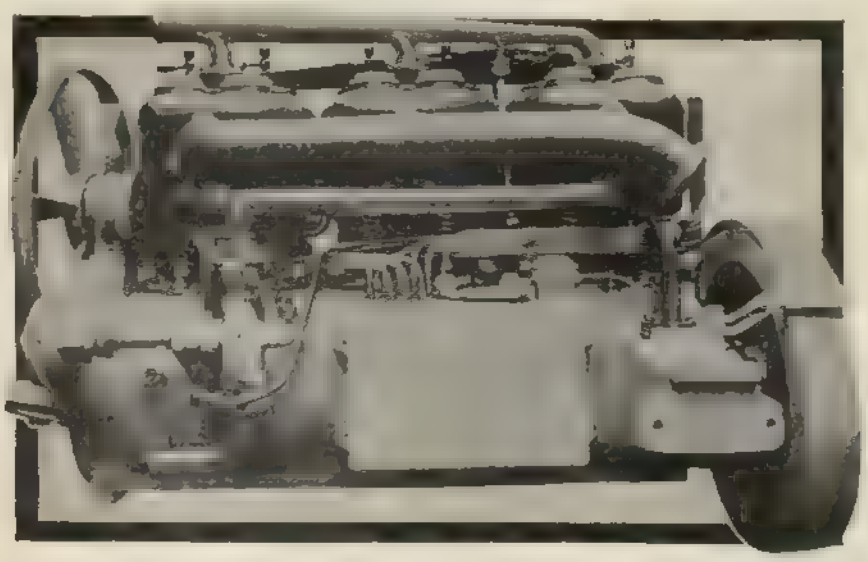


FIG. 2. Right hand side of the Thomas Model 3[illegible] 4½ x 5½ inches, gives completely water jacketed [illegible] Half time gears of the water pump. Tapered tubing with inlets to the three cylinders [illegible] is used. Note the heat area (grouped) of the [illegible] is from the mechanical oiler the fly wheel cover [illegible] ing the oil and at the centre of the fly wheel [illegible] gauge for assisting in correctly setting the valves

which carries the gas to the cylinders is 2⅛ inches, which is exactly half the diameter of the piston. The valve measures 2 5/16 inches across the head In order to provide for continuous running without loss overheating, the valves and stems have been completely water jacketed.

This complete water jackering prevents deformation of either the valve seat or of the cylinder at the top of the bore. The necessity of large, smooth gas passages will be appreciated when it is stated that the gases travel through these passages at a rate of speed approximately three-quarters of a mile a minute

The pistons are 5½ inches long and are provided with four narrow rings.

The connecting rod is made ¾ of an inch longer than the usual proportion of twice the stroke

THE BEARINGS

The bearings of the Model "M" have been made exceptionally large. The crank shaft is 1⅞ inches in diameter and is provided with four bearings, the total projected bearing area on the crank shaft

These bushings are easily renewed and since they are made in dies, are absolutely interchangeable

MATERIALS

The claim is made that all of the materials used in the entire motor are of the very best that can be obtained. The crank shaft is of a high grade of carbon steel and is heat-treated by a drop forge company which has made a specialty of crank shaft manufacture for the past six years. The connecting rods are 3½ per cent. nickel steel. Special piston ring iron is used for the rings. The cam shafts are of nickel steel. The gears are of steel and phosphor-bronze and the connecting rod bolts are of nickel steel.

The fly wheel is not of cast iron, as is usually the case, but of steel

PHONENDOSCOPE TEST

With the phonendoscope, a nice little surgical device, the motor has been thoroughly investigated to see just where noise was caused in its operation and thus these noises have been eliminated. To further secure quietness, herring-bone gears

have been used, which produce no end-thrust on the shafts. The valve plungers have been provided with fibre inserts, to reduce the noise at the point of contact of the valve plunger with the valve stem The valve stem clearance has been reduced about 50 per cent. by means of more accurate workmanship.

The necessity of balancing all rotating or reciprocating parts has been given careful attention. The pistons that enter the construction of any one motor are of the same weight. The crank shafts are also balanced, while, of course, the fly wheel receives the most careful attention The compression space of each cylinder is also measured so that an engine is assembled with equal compression spaces in all the cylinders. Uniform compressions result in uniform explosions and the motor runs with less vibration.

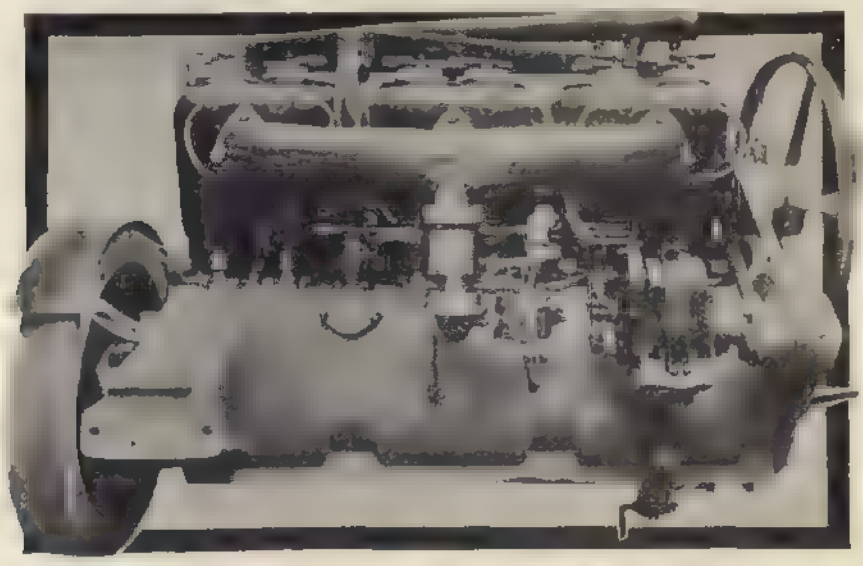


Fig. 3. Intake side of the Thomas Model M 6-cylinder motor. [illegible] cal 9-1 to the large inlet manifold, the special bracket carrying the [illegible] with thumb screw retards. Note the wires leading [illegible] insulating bar carrying the wires to the plugs in the heads. [illegible] spark.

THE CLUTCH

The patented Thomas three-disc clutch, which has been found to give excellent results in the past, is used on the 1910 product. The clutch disc is carried on two imported annular ball bearings, so that a scarcity of lubricant will not cause dragging.

The new clutch has the good features of the clutch previously used in that it is provided with cork inserts and has double adjustment

One detail to be mentioned in this connection is that the clutch operation has been made much easier by cranking the cross clutch shaft, so that less foot pressure is required.

Few realize the manner in which the frame actually twists in service so that preserving a permanent, correct alignment between various power transmission elements on an automobile is practically impossible. For this reason between the clutch and the transmission are two universal joints of the internal gear type which have been found to give such exceptional service on motor trucks, where all other forms of joints failed

THE CHANGE GEARS

The transmission complete weighs 82 pounds, which is less than two pounds per horse-power. This part of the mechanism is fitted with imported annular ball bearings and has been designed not only practically but theoretically correct, all parts being proportioned according to stress diagrams obtained by the methods of Graphical Statics

The transmission was designed to secure very short shafts and so have great rigidity. The annular bearings of the countershaft are but 8 7-16 inches center to center, and six annular bearings are used in the transmission.

The gears are of nickel steel, heat-treated by pack hardening in bone, allowing them to cool in the pot, reheating to between 1375 degrees and 1425 degrees and finally quenching in oil

The rear axle is made by Timken. Its casing is of pressed steel. Timken roller bearings are used throughout. The gears are four pitch with three to one ratio.

The front axle is made of nickel steel as are also the steering arms.

The springs are of alloy steel and it is claimed the question of price did not enter into their selection

Fig. 4. Front view of the new motor showing the complete housing of the gear and [illegible] mounted on its bearings [illegible] the end of the case. [illegible] motorcycle belt

IGNITION

The electrical system is believed to be the best obtainable. A Bosch DR-6 magneto furnishes current for one set of plugs, while the very successful Atwater-Kent Unisparker supplies the current for the second set

The engine piping is of drawn copper tubing made in neat form giving additional beauty to the engine

Among the little things that mark the good car should be mentioned the new ball and socket joint for operating the magneto, carburetor and other minor controls. This joint, it is stated, was most carefully developed after three weeks of work and is adjustable to 1-360 of an inch

The fenders and running board apron absolutely prevent any mud from splashing on the passengers

Both in general design and in attention to small details, the 1910 Model "M" will rank well with any of the cars in the world's market to-day. With full passenger load, gasoline, oil and water, the Model "M" has one horse power (A. L. A. M. rating) for every 94 pounds of weight. The experienced will at once realize what this means in hill climbing ability, and general all-around performance.

The Interstate Automobile Co., of Muncie, Ind., are now building a 440 by 140 addition to their present plant and plan to produce 2500 cars for 1910

Notice has been given that William C. Schoelkopf and H. C. Biddison, co-partners, doing business under the firm name, The Schoelkopf Manufacturing Company, of Madison, Wisconsin, have dissolved partnership. H. C. Biddison has purchased the entire interest of William C. Schoelkopf and will continue the business at the old stand under the name of The Biddison Manufacturing Company.

The great demand for Remy magnetos has led the Remy Electric Company, of Anderson, Ind., to establish branch selling offices at Kansas City and San Francisco. Mr. Edward F. Willett, of the New York office, will take charge of the San Francisco branch while Mr Ross E. Luellen, of the home office, will manage the Kansas City office.

The Gramm-Logan Motor Car Co. of Bowling Green, Ohio, announces the closing of its first fiscal year and at their stockholders' meeting held recently, the year's business was found to have resulted in a very satisfactory manner to the stockholders. A good cash dividend was and a considerable sum was placed in the surplus fund, besides, the plant and equipment have been very materially increased

formed with a capital of $100,000, known as the E. R. Thomas Motor-Branch Company. The officers are E. L. Thomas, president; J. M. Edsall, secretary and treasurer; C. S. Henshaw, manager. Their temporary offices are at 288 Columbus avenue, Boston, Mass

The incorporation of the Westinghouse Storage Battery Company, of Boonton, N. J., has been announced. The new concern has taken over the equipment, patents, plant and business of the storage battery department of The Westinghouse Machine Company and of the General Storage Battery Company.

The Mason Automobile Co., of Des Moines, Iowa, is moving its plant to Waterloo, Iowa, having recently purchased the Waterloo motor works, which is a factory of 100 by 300 feet and three stories high. The company will increase its capital stock to $1,000,000. About 300 people

James E. Plews, representing the White Steamer Automobile Company, has leased from George Holt the property at 2633-2709 Wabash Avenue, Chicago, Ill., at an annual rental of $1,500, for the ground and 7 per cent. on the cost of the building which is expected to reach $120,000. The lease runs for twenty years. Mr. Holt will erect a four-story reinforced concrete building for the lessees

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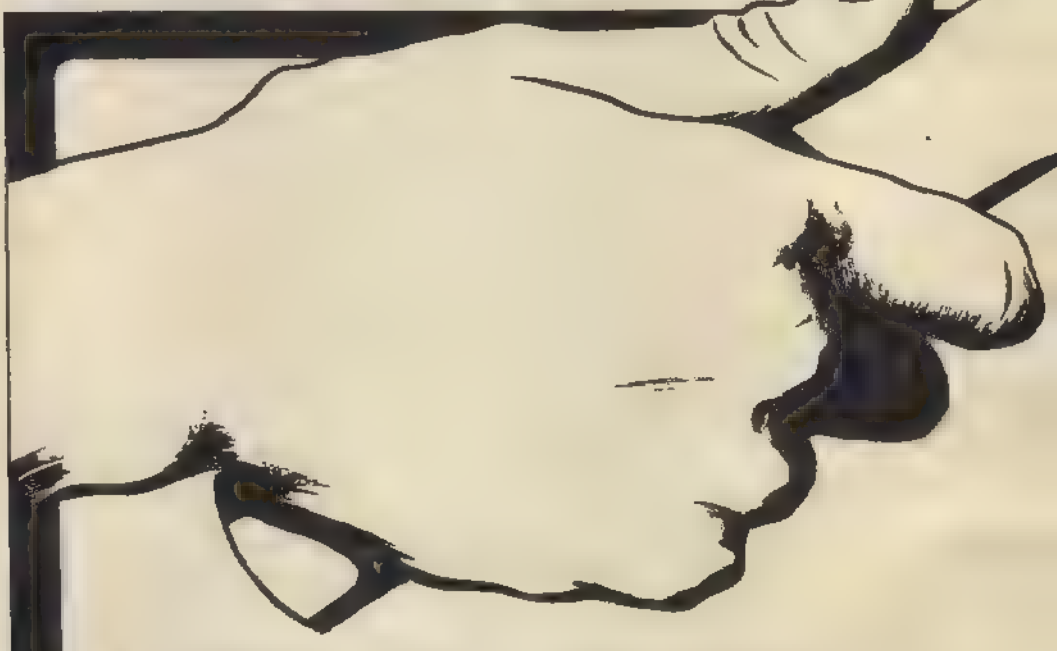

¶ It's built like a watch for accuracy, and like a battleship for strength. When it grips the nuts there is no play in the adjustments to injure nut and eventually make the wrench useless.

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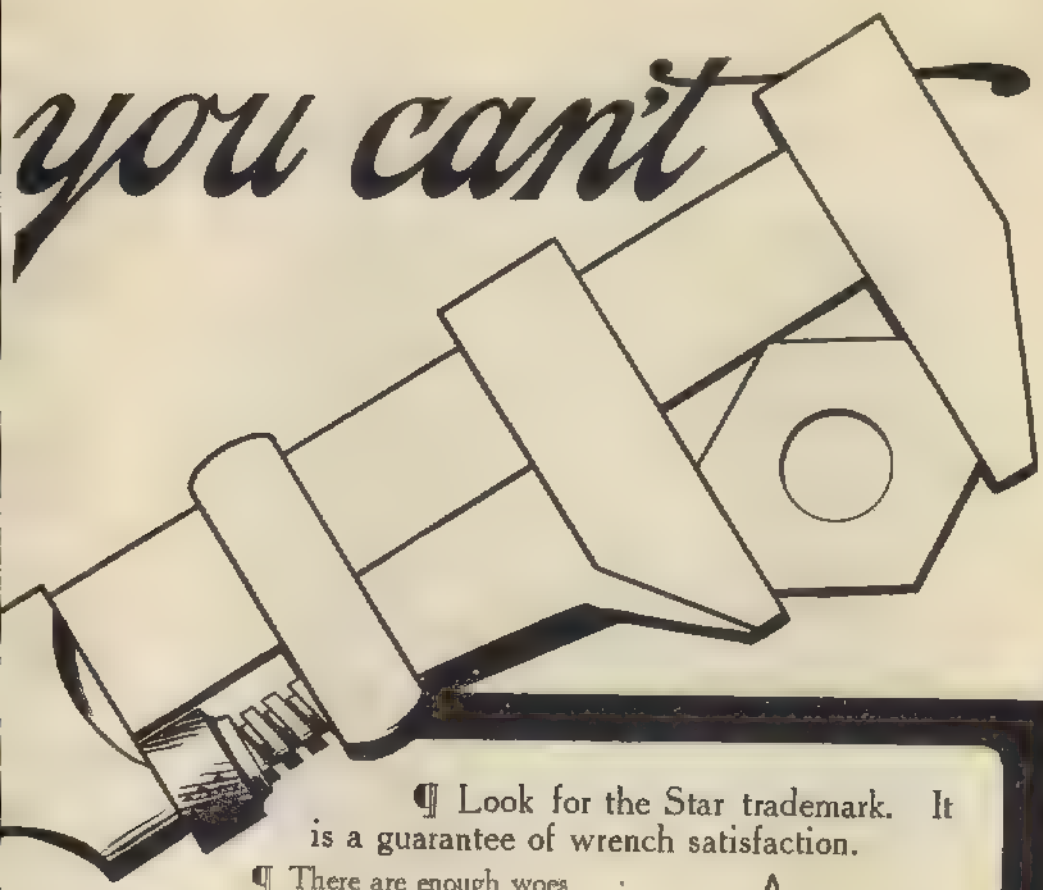

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¶ If the **COES** were not the best wrench made, it would not out-sell all others. "The one big bet" in the wrench business is the **COES.** Think this over.

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# One Year Ago and Now

¶ The fastest events of the 1908 hill-climb at Dead Horse Hill, Worcester, Mass., and Porter's Mountain, Cleveland, Ohio, were won by the

# Great Chadwick Six

We did not enter these contests this year, as we felt confident that the figures we set for 1908 would not be lowered. No cars were able to approach our times and our record stands.

¶ This demonstrates that the "GREAT CHADWICK SIX" is more than a year ahead of all others. Every month there are new evidences of the superiority of the "GREAT CHADWICK SIX."

¶ Victorious at Giant's Despair Mountain, May 30, 1909, and at Wildwood, N. J., July 5, when a regular 1910 stock model broke the mile record established by the 120 H. P. Fiat racer, making the distance in forty-one seconds flat, from a start of only two hundred yards.

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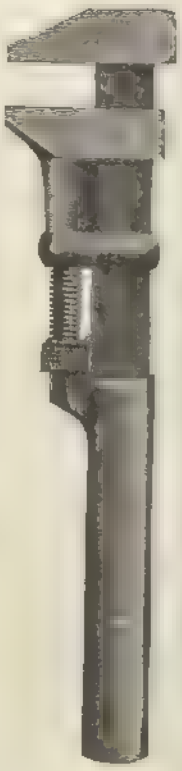
## Chadwick Engineering Works
## POTTSTOWN :: PENNSYLVANIA

# IN THE STARS

¶ **Coes Wrenches** are made in sufficient number of models to meet every requirement of the automobilist. They are all described in our Wrench Book, which will give you lots of interesting information as to how Coes Wrenches are made, the extraordinary care used in their manufacture and the system of inspection which positively prevents any flaws from creeping in.

¶ A postal request will bring it to you.



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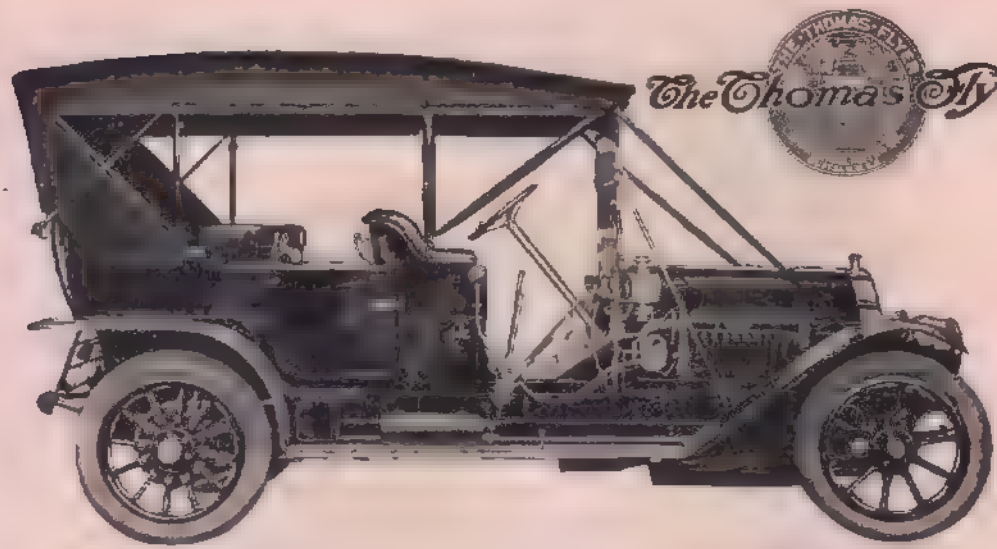


The Thomas Flyer

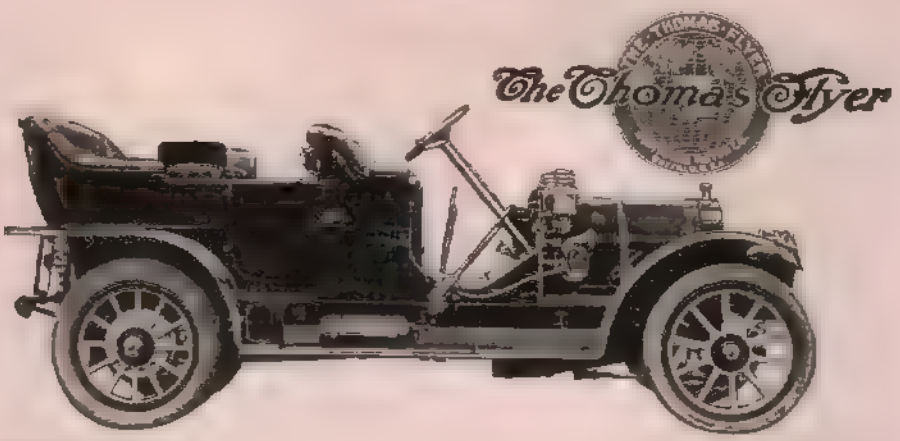
## Specifications of Thomas Flyer. Model "K" 6-70

**1910 Model**

| | |
|---|---|
| Seating Capacity | Touring Car, Limousine and Landaulet, seven. Tourabout, three or four, depending upon whether single or double rumble seat is used. Flyabout, four. |
| Body | Hand-hammered Aluminum body, luxuriously upholstered |
| Wheel Base | 140 inches |
| Tread | 56 inches |
| Motor | Six cylinders, four cycle, water cooled, cylinders cast separately. Seven separate bearings. |
| Horse Power | Seventy horse power |
| Ignition | Two separate and distinct systems. Bosch high tension magneto and Atwater-Kent spark generator |
| Lubrication | Mayer [illegible] oiler, feeds cylinders, crank case and chains. Transmission gears packed in grease; oil and grease cups are provided at all important bearings |
| Control | Spark and throttle control above 18-inch steering wheel. Foot accelerator. |
| Transmission | Four speeds forward and reverse, selective type sliding gear. Direct drive on high gear. The countershaft is idle on direct drive |
| Gear Ratio | Ratio of motor speed to that of the rear wheels is 3.6 to 1. |
| Clutch | Thomas three disc, cork inserts. Automatic clutch brake. Clutch interlocked with emergency brake lever. |
| Springs | Semi-elliptic front and rear. Rebound clip construction throughout |
| Drive | Side chain with hardened drop-forged steel sprockets |
| Bearings | Connecting rod and crank shaft, "Superior" babbitt. Seven large bearings. Cam shaft, "high speed" bronze. Transmission, annular ball and [illegible] shaft [illegible] gear, roller with ball thrust |
| Brakes | Internal expanding on rear wheels. External contracting on countershaft. Extra large braking surface |
| Cooling | Honeycomb Radiator. Gear Pump of large capacity. Large water passages. Cast Aluminum Fan |
| Steering Gear | Adjustable worm and sector type. Eighteen-inch wheel |
| Tires | Touring Car, Landaulet and Limousine, 38x4½ inches front, 38x5½ inches rear. Tourabout and Flyabout, 38x4½ inches front and rear. Detachable rims and Goodrich or Diamond tires are standard |
| Speed | Five to seventy miles an hour on high gear. |
| Equipment | Glass front, top with electric dome light and parcel carrier, 100 mile speedometer with clock, shock absorbers, robe rail, tire irons, trunk rack, acetylene headlights, combination oil and electric side and tail lamps with storage battery, electric cigar lighter in tonneau, Prest-O-Lite tank |
| Color | Landaulet and Limousine, maroon with olive gray upholstering. Tourabout, Flyabout and Touring Car, royal blue with straw color running gear or Thomas red with light red running gear |
| Price | Touring Car, Flyabout, Tourabout, $6000 complete. Limousine, Landaulet, $[illegible] |

# E. R. THOMAS MOTOR CO., Buffalo, U.S.A.

**Licensed under Selden Patent**




## Specifications of Thomas Flyer. Model "F" 4-60

**1910 Model**

| | |
|---|---|
| **Seating Capacity** | Landaulet, Limousine, Touring Car, seven. Tourabout, three or four depending upon whether single or double rumble seat is used. Flyabout, four |
| **Body** | Hand-hammered Aluminum body, luxuriously upholstered. |
| **Wheel Base** | 127 inches |
| **Tread** | 56 inches |
| **Motor** | Four cylinders, four cycle, water cooled, cylinders cast separately. Five separate bearings |
| **Horse Power** | Sixty horse power. |
| **Ignition** | Two separate and distinct systems. Bosch high tension magneto and Atwater-Kent spark generator |
| **Lubrication** | Mechanical eight-point oiler feeds cylinders, crank case and chains. Transmission gears packed in grease. Oil or grease cups at all important bearings |
| **Control** | Spark and throttle control above 15-inch steering wheel. Foot accelerator |
| **Transmission** | Four speeds forward and reverse, sliding gear selective type. Direct drive on high gear. The countershaft is idle on direct drive. |
| **Gear Ratio** | Ratio of motor speed to that of rear wheel is 3.6 to 1 |
| **Clutch** | Thomas three disc with cork inserts. Automatic clutch brake. Clutch interlocked with emergency brake |
| **Springs** | Semi-elliptic front and rear. Reinforced clip construction throughout |
| **Drive** | Side chain with hardened drop-forged steel sprockets |
| **Bearings** | Connecting rods and crank shaft, Superior babbitt. Cam shaft, high speed" bronze. Transmission, annular ball and roller. Countershaft annular ball. Front hub bearings, roller. Rear hub, annular ball. Steering gear, roller with ball thrust |
| **Brakes** | Internal expanding on rear wheels. External contracting on countershaft. Extra large braking surface |
| **Cooling** | Honeycomb Radiator. Gear pump of large capacity. Large water passages. Cast Aluminum fan. |
| **Steering Gear** | Adjustable worm and sector type. Eighteen inch wheel |
| **Tires** | Landaulet, Limousine and Touring Car, 36x4½ inches front, 36x5 inches rear. Tourabout and Flyabout, 36x4½ inches front, 36x4½ inches rear. Detachable rims and Goodrich or Diamond tires are standard. |
| **Speed** | Five to sixty miles an hour on high gear |
| **Equipment** | Combination oil and electric side and tail lamps with storage battery, acetylene headlights, horn, coat rack, trunk rack, tire irons, Prest-O-Lite tank and shock absorbers. |
| **Color** | Landaulet and Limousine, maroon with olive gray upholstering. Tourabout, Flyabout and Touring Car, royal blue with straw color running gear or Thomas red with light red running gear |
| **Price** | Touring Car, Flyabout, Tourabout, $4000. Limousine, Landaulet $6000 |

# E. R. THOMAS MOTOR CO., Buffalo, U.S.A.

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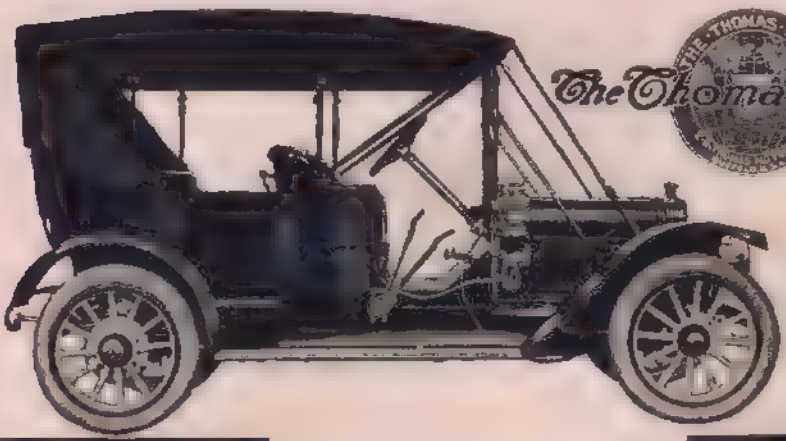

The Thomas Flyer

## Specifications of Thomas Flyer. Model "M" 6-40

**1910 Model**

| | |
|---|---|
| Seating Capacity | Touring Car, five. Combination Car (including features of Runabout, Tourabout and Flyabout), three and four. Runabout, three or four. Tourabout and Flyabout, four. Limousine and Landaulet, seven |
| Body | Hand-hammered Aluminum, luxuriously upholstered |
| Wheel Base | 125 inches |
| Tread | 56 inches. |
| Motor | Six cylinder, four cycle, water cooled, cylinders cast in pairs. 4¼-inch bore by 5½-inch stroke |
| Horse Power | Forty horse power. (43.8 A. L. A. M. rating) |
| Ignition | Two separate and distinct systems. Bosch high tension magneto and Atwater-Kent unisparker with battery |
| Lubrication | Mechanical oiler with sight feed on dashboard. Transmission gears packed in grease. Oil or grease cups at all important bearings |
| Control | Spark and throttle control above 18-inch steering wheel. Foot accelerator |
| Transmission | Three speeds forward and a reverse, selective type sliding gear. Direct drive on high gear. |
| Gear Ratio | Three to one |
| Clutch | Thomas three disc with cork inserts, enclosed in oil-tight case. Automatic clutch brake |
| Springs | Semi-elliptic front. Three-quarter elliptic rear. Rebound clip construction throughout |
| Drive | Shaft drive. Bevel gears in oil-tight case. |
| Bearings | Crank shaft and connecting rods, best die cast babbitt. Cam shaft phosphor bronze. Transmission, annular ball. Front and rear hubs, Timken roller. Steering gear, roller with ball thrust |
| Brakes | Internal and external on rear wheels. Unusually large braking surface |
| Cooling | Honeycomb radiator. Centrifugal pump. Large water passages. Belt driven fan of cast aluminum |
| Steering Gear | Adjustable worm and sector type |
| Tires | Goodrich or Diamond tires. Quick Detachable rims<br>36x4½-inch front and rear on Touring Car, Flyabout and Runabout<br>36x4½-inch front and 37x5-inch rear on Limousine and Landaulet |
| Speed | Five to fifty-five miles per hour on direct drive. |
| Equipment | Top, glass front, speedometer, shock absorbers, head side and tail lamps horn, robe rail, tire irons, Prest-O-Lite tank |
| Color | Landaulet and Limousine, maroon with French gray worsted upholstering. Touring Car, Combination Car, Runabout, Tourabout and Flyabout royal blue with straw color running gear or Thomas red with light red running gear |
| Price | Touring Car, Flyabout, Tourabout, $3500 complete. Limousine, $5000 Landaulet, $5150. |

# E. R. THOMAS MOTOR CO., Buffalo, U.S.A.

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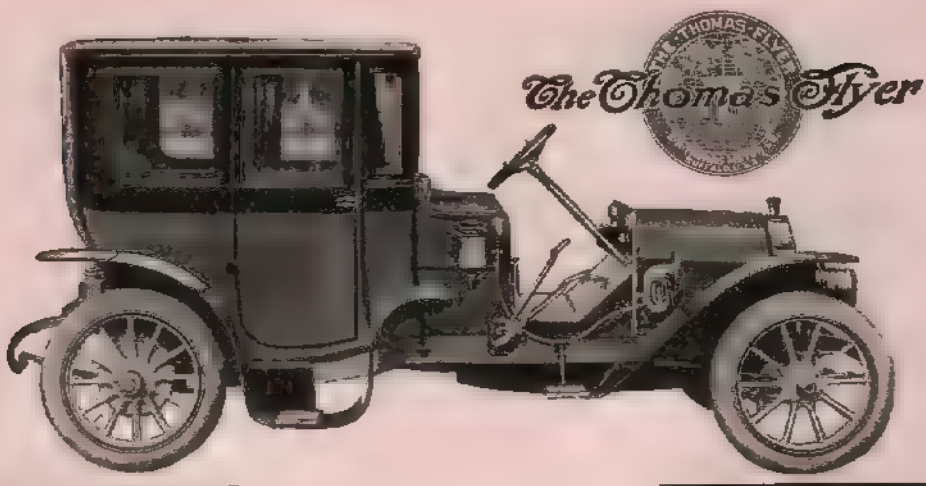


## Specifications of Thomas Town Car. Model "R" 4-28

**1910 Model**

| | |
|---|---|
| Seating Capacity | Six. Four passengers inside |
| Body | Hand-hammered Aluminum upholstered in imported worsted or broadcloth; morocco optional. Luxurious, deep cushions. Patent leather fenders. |
| Wheel Base | 123 inches |
| Tread | 56 inches |
| Motor | Four cylinders, four cycle, water cooled, cylinders cast in pairs 4¼-inch bore by 5½-inch stroke. |
| Horse Power | Twenty-eight horse power (28.9 A. L. A. M. rating.) |
| Ignition | Two separate and distinct systems. Bosch high tension magneto and Atwater-Kent unsparker with battery |
| Lubrication | Mechanical oiler with sight feed on dashboard. Transmission gears packed in grease. Oil or grease cups at all important bearings |
| Control | Spark and throttle control above 18-inch steering wheel. Foot accelerator |
| Transmission | Three speeds forward and a reverse, selective type sliding gear. Direct drive on high gear |
| Gear Ratio | Three to one. |
| Clutch | Thomas three disc with cork inserts enclosed in oil-tight case. Automatic clutch brake |
| Springs | Semi-elliptic front. Three-quarter elliptic rear. Rebound clip construction throughout. |
| Drive | Shaft drive. Bevel gears in oil-tight case |
| Bearings | Crank shaft and connecting rods, best die cast babbitt. Cam shaft, phosphor bronze. Transmission, annular ball. Front and rear hubs, Timken roller. Steering gear, roller with ball thrust. |
| Brakes | Internal and external on rear wheels. Unusually large braking surface |
| Cooling | Honeycomb radiator. Centrifugal pump. Large water passages. Belt driven fan of cast aluminum. |
| Steering Gear | Adjustable worm and sector type |
| Tires | Goodrich or Diamond tires. 34x4½-inch front and rear. Quick Detachable rims. |
| Speed | Five to forty-five miles per hour on direct drive |
| Equipment | Head, side and tail lamps, horn, tire irons, Prest-O-Lite tank |
| Color | Brilliant blue with black trimmings and azure blue running gear. Black upholstering on front seat. French gray worsted interior. |
| Price | Brougham, $4000. Limousine, $4100. Landaulet, $4250 |

# E. R. THOMAS MOTOR CO., Buffalo, U.S.A.

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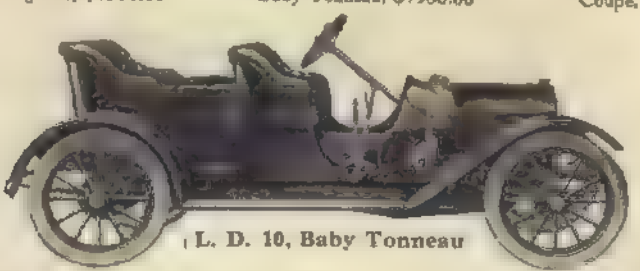
# KISSEL

## Unslighted Quality Reasonable Price

For 1910, as always before, a car of uncompromised quality such as has been demonstrated by the "stand-up" records of thousands of cars in use. ¶ Yet for 1910 an emphatically improved car and an assortment of models with a wider range in horse-power, price and capacity. ¶ On 1910 models upper halves of ¾ elliptic springs are fastened integrally to rear end of frames and are practically an integral part of frame, which, with the increased wheel base, and lowerings of frame, produces a car of sturdy rig dity, at the same time increasing comfort and decreasing tire wear, and general wear by minimizing side jolts, adding also to the rakish, classy and aristocratic appearance of the car.

### MODEL L. D. 10

Touring Car, $1500.00 Baby Tonneau, $1500.00 Coupe, $2000.00



L. D. 10, Baby Tonneau

4-cylinder, 30 H. P. 2, 4 and 5 passengers 112-inch wheel base
Remy magneto and dry cells Selective type transmission 3 speeds forward and reverse
Dropped Frame 34 x 4 inch wheels.

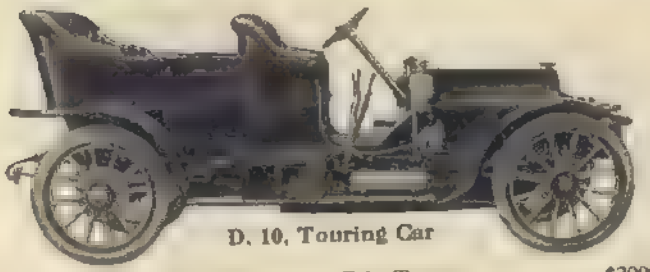
MODEL L. D. 10
Touring Car

# KAR for 1910

**MODEL**

**D. 10 $2000.00**

D. 10, Baby Tonneau



D. 10, Touring Car

| | | | |
|---|---|---|---|
| Touring Car - - | $2000.00 | Baby Tonneau - - | $2000.00 |
| Coupe - - - | $2500.00 | Limousine - - - | $3200.00 |

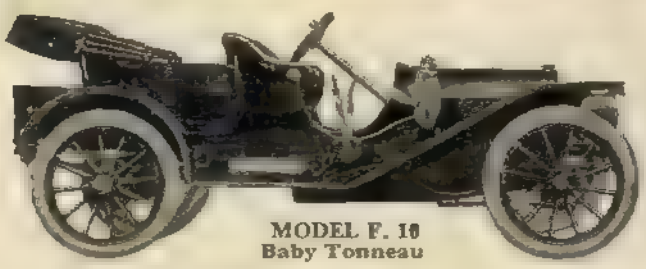
4-cylinder, 50 H. P.
4 speeds forward and reverse
120-inch wheel base
Dropped frame
5 and 7 passengers
Selective type transmission
Remy magneto
36-inch wheels

Transmission on 1910 cars will be ball bearing throughout—four speeds forward and reverse, with direct drive on third speed and with fourth speed geared up about 25 per cent. above motor, reverse idler at rest when not in reverse. ¶ Double internal brakes of high power will be used for 1910, instead of internal and external; magneto and water pump shifted to opposite side of motor, leaving valves easily accessible. Chrome Vanadium heat-treated steel used in all forgings.

**Kissel Motor Car Co.**
**Hartford, Wis.**

# KISSEL

Beyond all doubt, Kissel Kars for 1910 represent the highest type of automobile construction, offering an assortment of cars any one of which can be purchased with the assurance that in appearance, economy and actual motoring ability, it will far surpass cars selling at the same prices, completely equalling the most expensive American and foreign cars. Reasonable in price—uncompromised in quality—that's the distinctive fact about Kissel Kars.



MODEL F. 10
Baby Tonneau

## MODEL F. 10

| | | | |
|---|---|---|---|
| Touring Car - - | $2500.00 | Baby Tonneau - - | $2500.00 |
| Coupe - - - | $3000.00 | Limousine - - - | $3700.00 |

4-cylinder 50 H. P. 7 passengers

DROPPED FRAME — WHEEL BASE: 124 inches
SELECTIVE TYPE TRANSMISSION. 4 speeds forward and reverse, foot accelerator
BOSCH MAGNETO — ATWATER KENT GENERATOR
WHEELS 36 x 4 regular, 40 inches on Baby Tonneau

MODEL F. 10
Touring Car

# KAR for 1910

## MODEL G. 10

G. 10, Touring Car

G. 10, Baby Tonneau

| | | | |
|---|---|---|---|
| Touring Car - - - | $3000.00 | Baby Tonneau - - - | $3000.00 |
| Coupe - - - | $3600.00 | Limousine - - - | $4200.00 |

6-cylinder, 60 H. P. Wheel base, 132 inches 7 passengers
Selective type transmission, four speeds forward and reverse, foot accelerator
Dropped Frame
Wheels, 36 x 4½ inches rear, 36 x 4 inches front, 40 inches on Baby Tonneau
Bosch magneto and Atwater-Kent generator

## The Complete Kissel Kar Line

includes cars of every desirable size and body, with prices ranging accordingly. You will find in the line a car of the right horse-power, size and style to meet any average need. Write for catalog and name of representative who will give you a demonstration.

**Kissel Motor Car Co.**
**120 Kissel Ave., Hartford, Wis.**

"It is certain the advent of the Maxwell Runabout at $600 sounds the knell of the horse and buggy.
Benj. Briscoe PRES'T."
"Maxwell"
The Aristocrat of Moderate Priced Cars
"Model A A"
12 H.P. Business Runabout $600.

# Here It Is

# An Automobile

# Within the Reach of all—$600

**The car for which the World has waited. A high-grade, reliable business runabout. Costs less to keep than a horse and buggy—does the work of three.**

**When not in use expenses stop. A horse eats all the time—this MAXWELL is vastly more economical.**

**SALE OF MAXWELL CARS TO DATE**

| | |
|---|---|
| SOLD TO OCTOBER 30, '09 | 19,391 |
| SOLD DURING NOVEMBER, '09 | 526 |
| **Maxwells in use to-day** | **19,917** |

**WATCH THE FIGURES GROW**

**MAXWELL-BRISCOE**

Main Office
DALE STREET,
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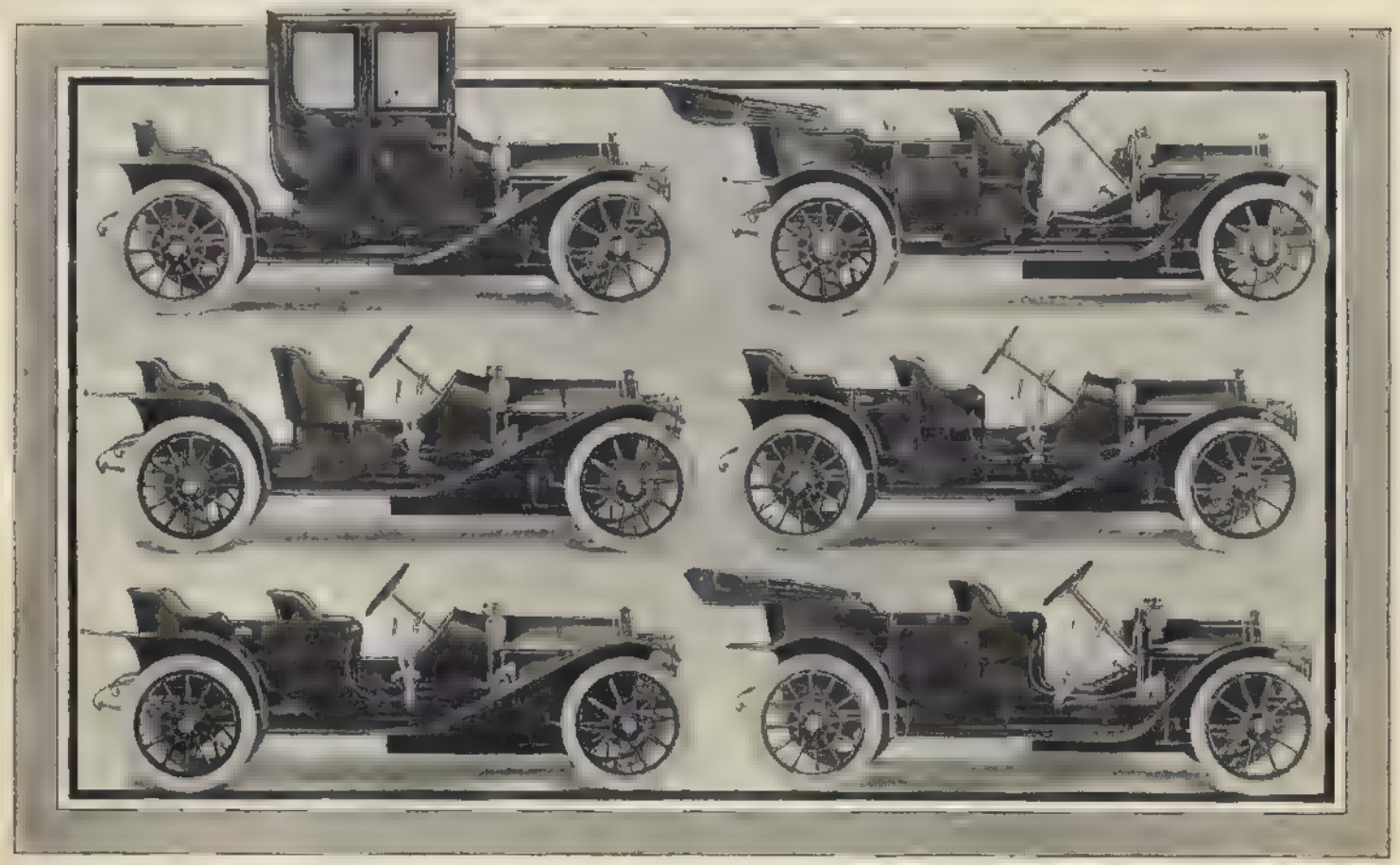
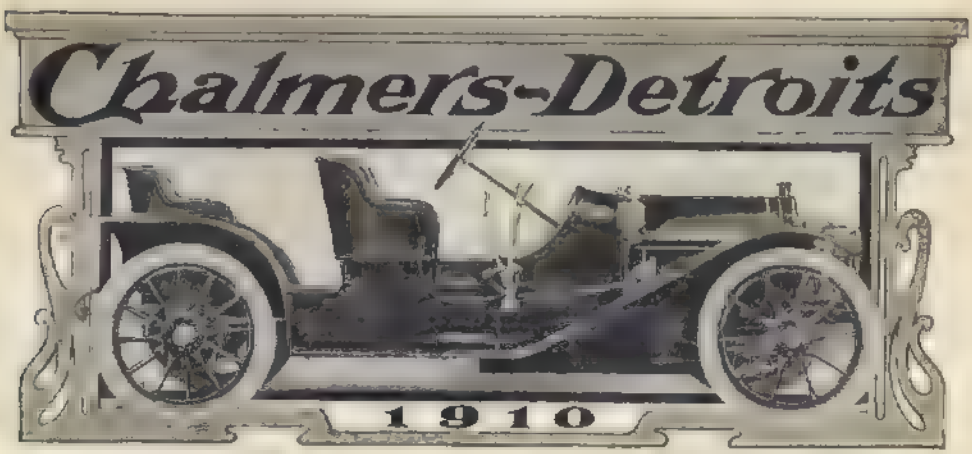


Group of 1910 Chalmers-Detroit models showing the various styles of bodies offered for the coming season. In the left column, beginning at the top, is the 30 Coupe fitted with rain vision sash at the rear. The wheel base has been increased 1 1/2 inches and the motor has been refined and lengthened. Price, $3100. Below it is the 40 Roadster, motor 5 inches x 4½ inches, and below it is shown the 40 close coupled car. In the right hand column at the top is the 40 seven passenger touring car. All the 40 models are $2,400 and $875 is charged extra for the two extra seats of the touring car. The other two models are the 30 close coupled and the 30 touring car, price $1500.




Two chassis models will be manufactured by the Chalmers Detroit Motor Company for 1910. Both models will practically be a continuation of those presented for 1909 with such modifications as a year's experience has shown to be advisable. Various bodies to suit every taste will be furnished to fit the "30" chassis, while the "Forty" chassis will be fitted with touring car, pony tonneau and roadster type bodies.

The "30" chassis will have a motor 4 in. x 4½ in., an increase of ⅛ in. over the bore of the 1909 car. In practically every other respect the motor will be identical with last season's, except that the oil pump has been placed in a more accessible position. The crank shaft is still mounted on two ball bearings as this has proved during the past season to be very satisfactory.

Large inlet valves mounted in the heads of the cylinders, which have been a feature of the Chalmers-Detroit "30" since its inception, are retained for 1910.

The circulating positive feed oiling system is retained in practically its original form. The Chalmers-Detroit construction of inlet manifold castings in one piece with water jacket side plates is a special feature this year as last. Perhaps the most striking feature to the casual observer is the size of the exhaust manifold and piping to muffler, this combined with large exhaust valves being used to eliminate all back pressure and to clear the cylinders promptly of burned gases.

The multiple disc clutch for 1909 has

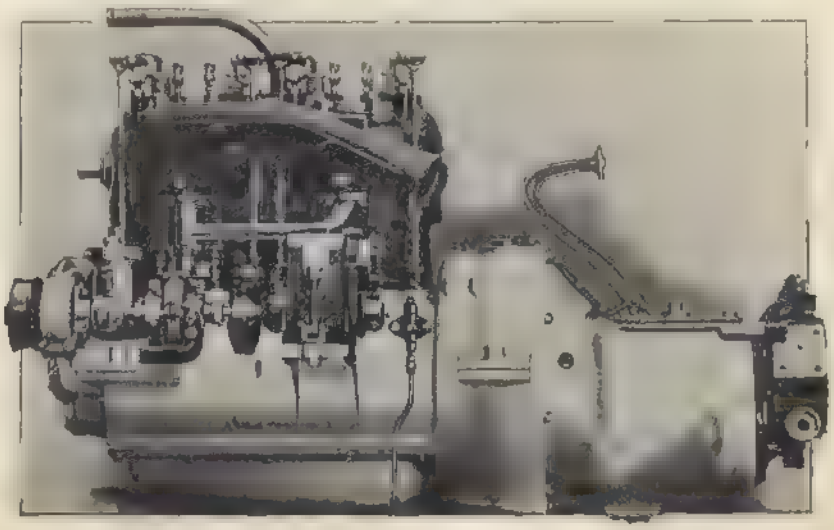


Fig. 1. Exhaust side of the Chalmers-Detroit "30" unit power plant. The exhaust manifold is unusually large being 2¼ inches. Magneto is mounted on an integral bracket of the crank case. A plunger oil pump is operated by an inlet cam of the cam shaft. All parts are completely housed.

been so successful that it has been retained exactly as it was. The transmission is in a unit with the motor and clutch. Three speeds and reverse are provided with a selective arrangement. The bearings throughout are annular ball. The gears are made of chrome vanadium steel, and treated with the greatest care. The teeth are all heavy pitch and the gears arranged in as compact a manner as possible in order to keep the shafts short.

casing. The axle is of the full floating type, annular ball bearings being used throughout including the hub bearings. A compact bevel gear differential is used having four pinions

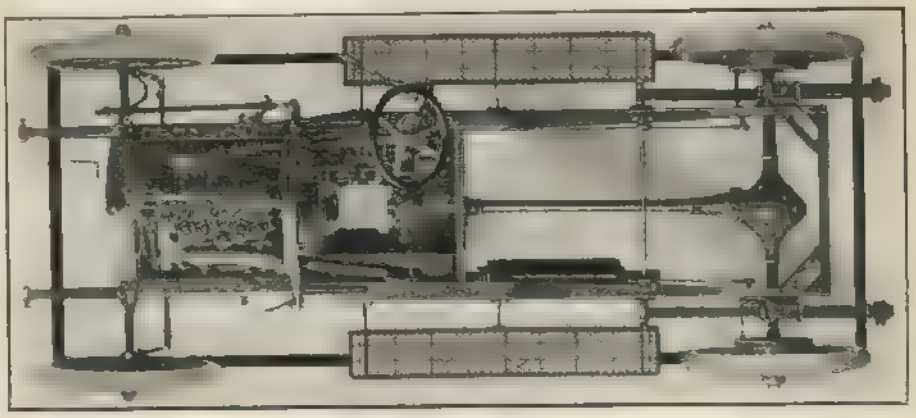


Fig. 2. Chalmers-Detroit "30" chassis from above [illegible] Note clean cut appearance [illegible] self contained unit [illegible] side frame members

Following the usual Chalmers-Detroit practice, one transmission brake, actuated by a pedal, is provided immediately behind the gear case. One set of internal expanding brakes operated from a side lever are placed directly on the rear

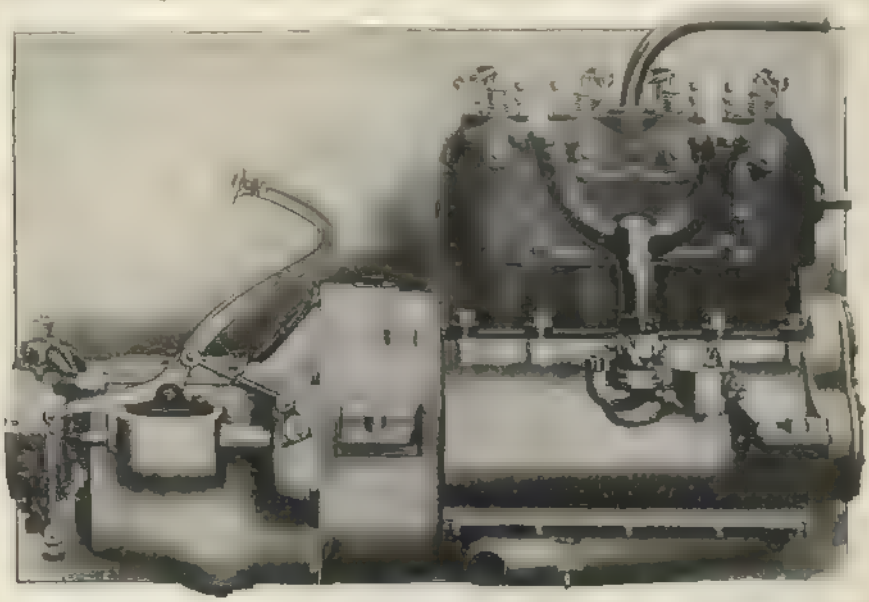


Fig. 3. Intake side of Chalmers-Detroit "30" unit power plant. Valve tappets and inlet valves are unusually heavy. An improved method is used of applying the oil screening and straining apparatus. The transmission brake is supported on the rear of transmission by suitable drop forgings. Hinged pedal pad is used on the transmission brake rod. Toggle motion from clutch and brake pedal to the clutch enables the operator to entirely throw out the [illegible] is also a dash [illegible] used [illegible] in place. Same method of fastening is used on the cylinders

The final drive takes place through a single steel bushed metal cased universal joint back of the transmission through a propeller shaft surrounded by a torsion sleeve bolted at its rear end to the axle

wheels. The placing of the foot brake on the transmission, the makers point out, has a number of advantages, among which may be mentioned: The increased braking power owing to the drum being geared

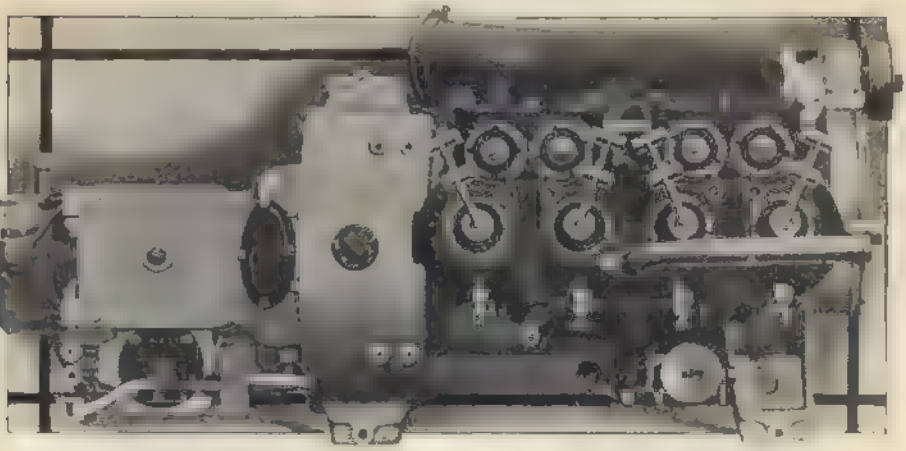


Fig. 4. Chalmers Detroit "30" unit power plant from left. Note the accessibility of inlet and exhaust valves. Transmission and clutch compartments are also easy to reach in case adjustment is necessary. All moving parts except valve lifters and fan pulleys are enclosed.

up from the wheels; simplicity, cleanliness, the removal of weight from the axle and the consequent saving in tire wear, complete equalization of braking effort between the two wheels independently of the condition of the braking or the road surfaces. As against these advantages, only one disadvantage is cited, and that is the transmission of the braking effort through the rear axle driving mechanism. However, this mechanism must be amply strong to allow the motor slipping the rear wheels under all conditions of load and road surfaces.

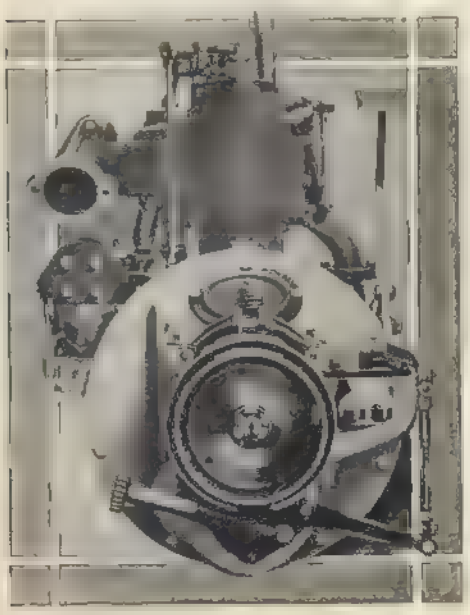


Fig. 5. Rear of Chalmers-Detroit "30" motor showing the transmission service brake. Note the cam of adjustment by means of the knurled hand wheel at the left, also the substantial manner in which the brake is mounted.

The braking effort can't possibly exceed this, in fact, must always remain somewhat less. A brake placed on the transmission can therefore never strain the driving mechanism quite as much as the motor itself is capable of doing, but it must be remembered that what strain and wear it does bring is in addition to that brought by the motor

The steering gear remains exactly as it was during the past year. The shifting mechanism has been improved by inclosing it hermetically in separate casings The frame has been dropped behind the front seats so as to lower the rear foot boards and the center of gravity of the whole car. The upper and lower flanges have been very much widened to give extreme stiffness, thus relieving the mechanism and body from severe strain.

34x3½ tires are being fitted for 1910 as against 32x3½ for 1909

All spring shackles and other working parts are provided with generous grease cups and remarkable care has been exercised to effectively and neatly lock all running gear nuts and bolts

The general appearance of the car has been improved by lengthening the wheel base and body. The hood has been raised and lengthened to conform to the increased size of the car. The wheel base is 115 inches as against 110 inches last year, the tread remaining standard, though a 60 inch tread will be option on cars going to the South.

### THE "FORTY."

The Chalmers Detroit "Forty" model will incorporate very few changes mechanically from last year's construction, although the wheel base has been greatly lengthened and the touring body enlarged to make room for seven passengers.

The motor will continue to be 5x4¾, with inlet and exhaust valves all on one

side; a three plain bearing crank shaft, and a circulating oiling system.

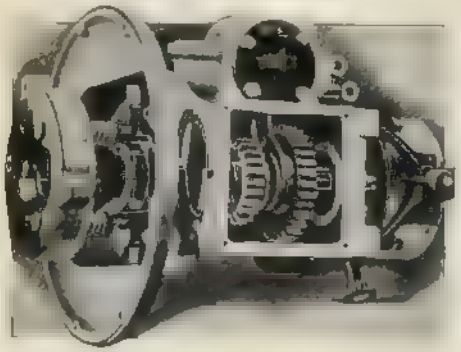


Fig. 6. Clutch and transmission of Chalmers-Detroit "30." The clutch, transmission, and brake may be removed without disturbing other parts. Clutch springs may be adjusted through oval hand hole in clutch case. The clutch throw-out collar is faced with a friction band forming a brake and stopping the spinning of clutch when thrown out. Attention is directed to the anchorage of service brake. Conical clutch pressure plate has the rim turned up at its greatest diameter making it more rigid and insuring even pressure on clutch plates.

The leather faced cone clutch itself remains practically unchanged, but the operating mechanism has been modified so that the pressure on the pedal required to throw it has been reduced to about one third of the former pressure.

TRANSMISSION CHANGES

The gear box has been changed by placing the lay or counter shaft underneath the through shaft instead of above it as in the past. The transmission this year will be mounted throughout on annular ball bearings. A double universal joint drive has been retained, the torque being now taken up by a triangular arm instead of a single lever. The rear axle will be of pressed steel, autogenously welded along the neutral axis giving the greatest possible amount of strength for a given weight, so much so that no strut rod is considered necessary. The frame has been dropped as in the "30" under the side doors. The upper and lower flanges of the frame have been made very much deeper following the best European practice. This insures a rigid foundation for the body, preventing the binding of doors, etc., so frequently met with. A honeycombed radiator has been substituted on the "Forty" for one of the vertical tube type. The axle is of the full floating type with bevel gear differential. No brace is used under this axle.

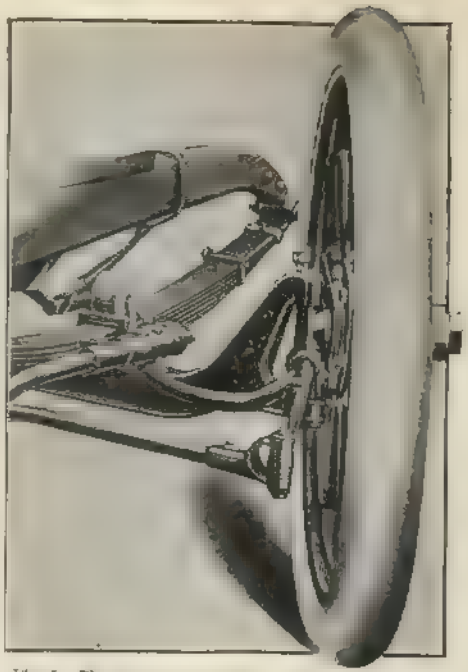


Fig. 7. The steering connections of Chalmers-Detroit cars. Front axles are single piece I beam, drop forged. Note [illegible] steering cross rod.

The "30" is furnished in touring car, pony tonneau, and roadster at $1,500; as an inside drive coupe for $2,100, and as a limousine and landaulet for $2,750. All styles of the "Forty"—touring car, pony tonneau, and roadster are $2,750, except that $75 additional is asked for two extra seats in the touring car.

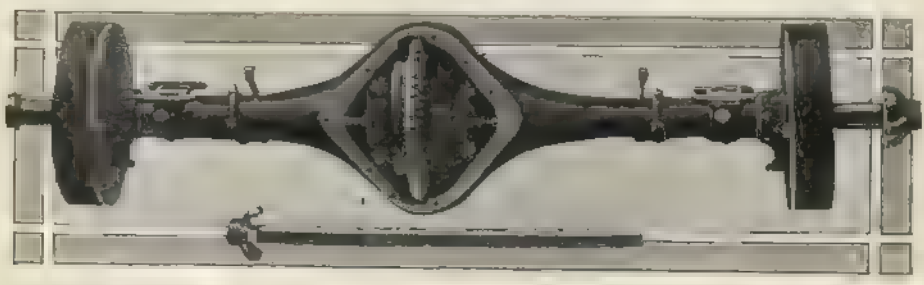
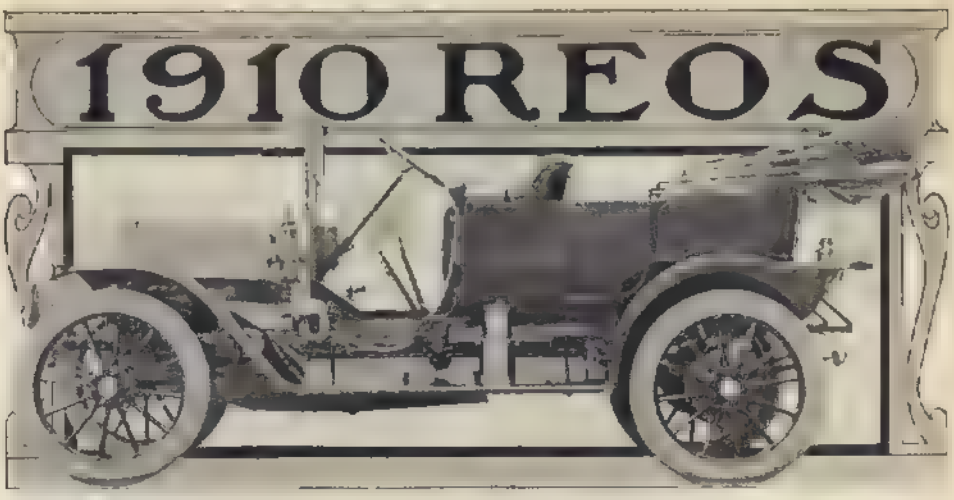


Fig. 8. Chalmers-Detroit rear axle, showing accessibility of parts. This axle is of the full floating type, wheels [illegible] driven [illegible].

The Pittsburgh Motor Vehicle Company takes this opportunity of advising the trade that it is still doing business as usual in Pittsburgh, Pa., and intends to continue so doing and has not moved to Washington, D. C., as was circulated in a false report and published by certain trade papers.

# 1910 REOS



While combining the very best foreign and domestic practice, the new 4-cylinder Reo cars made by the Reo Motor Car Company, of Lansing, Mich., will be strictly American in general design and construction, even going so far as to have the steering wheel on the left-hand side, a practice that is coming into general use. The motor is a 4 cylinder vertical with the cylinders cast in pairs. The bore is 4 inches with a stroke of 4½ inches, while the horse power rating is 30 35. The long stroke is a feature that has been coming to the front for the past year. The car will sell at the popular price of $1250. A detailed description follows

The cylinders are all made of a special close grained cylinder iron, and are cast in pairs.

The crank case is cast in one piece, giving great rigidity and avoiding all leakage of oil through packed joints of the two-piece type. Connecting rod adjustments can be readily made by simply removing the two hand hole plates on the side of the case. The main crank shaft bearings are adjustable from the outside of the crank case. These features avoid practically any dismantling of the motor in order to adjust the main and connecting rod bearings. The entire operation of adjusting the bearings, it is claimed, does not take over one-half hour

The crank shaft is of special high grade manganese steel, having a tensile strength of 110,000 pounds to the square inch. The crank pins are 1½ inches diameter, 2¼ inches long. The three main bearings have a combined length of 10½ inches, with 1¾ inch diameter. The crank shaft is offset from the center line of cylinders as is also the cam shaft from the center line of valve plunger guides. This is to avoid excessive piston and cam thrust on cylinders and valve lifter guides.

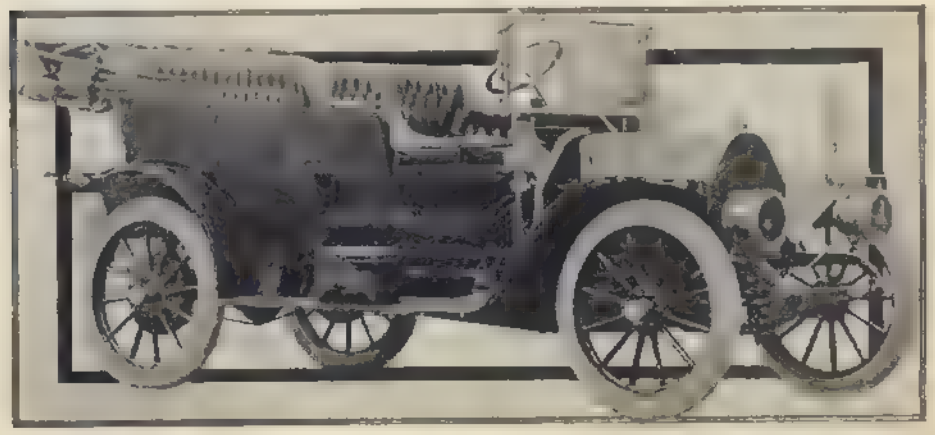


Fig. 1. Reo, Model R, 4 cylinder motor, 4 by 4½ inches, 30-35 H. P. Passenger capacity five. Price $1250. The new touring car model follows approved touring car practice as applied to four-cylinder cars. It has a wheel base of 106 inches, right hand drive, center control. Made in Quick Detachable Demountable and standard tread.

The cam shaft is of large diameter, running in three bronze bearings, and is easily removed. The cam gears are all spiral cut, giving freedom from noise. These gears run in a bath of oil constantly maintained by the motor lubricating system.

The valve lifters are all adjustable, and have hard fibre inserts to deaden the noise Valves are of large diameter, bevel seated, 35 inch nickel steel heads, electrically welded to cold rolled round steel stems.

Fly wheel is of ample diameter to secure steady running. It has formed within it fan blades to assist in keeping the motor cooled and removing the dead gases from under the hood.

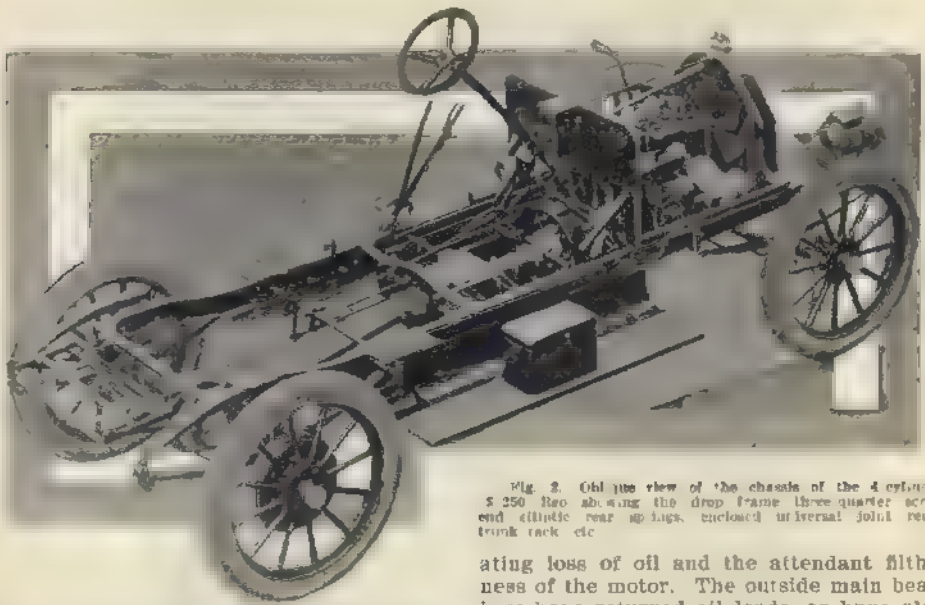


Fig. 2. Oblique view of the chassis of the 4 cylinder $ 250 Reo showing the drop frame three quarter scroll end elliptic rear springs, enclosed universal joint rear trunk rack etc

OILING SYSTEM.

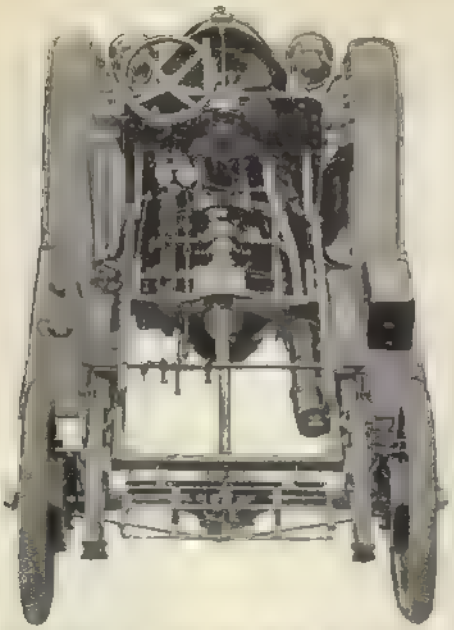
The oiling system is of the pump circulative splash type. A single large plunger pump is driven from the cam shaft through an eccentric. It delivers oil from the oil reservoir to the three main bearings of the motor, also to the face of the cam gears. This oil then collects in partition reservoirs in the bottom of the crank case, and is maintained at a constant level. The connecting rods dipping into this oil cause a fine spray which lubricates the cylinders and piston, the amount reaching the cylinders being governed by splash plates. There are in this oiling system no outside pipes or connections to get loose or leak; no stuffing boxes on the pump to require attention, no additional driving gears to operate the pump; no adjustments except those made at the factory when the motor is assembled. The pump is self-cleaning, which instead of drawing all the particles of lint and dirt into the protecting screen by steady suction—as in a gear pump—keeps the screen clean by discharging at least one-half of its capacity against the screen at each stroke. Instead of a large oil reservoir holding two or three gallons, an oil reservoir holding three quarts. This is advisable, since it eliminates the trouble arising from so large a quantity of lubricating oil becoming very dirty and full of carbon deposits. The addition of fresh oil every 250 to 300 miles, the makers claim is far preferable to a larger quantity at longer intervals. Particular attention is paid to making the motor oil tight, eliminating loss of oil and the attendant filthiness of the motor. The outside main bearings have returned oil leads, as have also the magneto and pump shaft. The valve plunger guides have recesses at the top for collecting oil and returning it to the crank case, and also have protecting caps carefully fitted to keep the dirt out and the oil in. The motor has only a single grease cup—located on the fan

The water pump is of the centrifugal type, and is driven from the magneto shaft.

The fan is mounted on ball bearings, and is driven by a ⅞ inch flat endless belt The belt adjustment is very convenient and positive.

CLUTCH

The clutch is of the multiple disc type. The discs are hardened steel and phosphor bronze, the steel discs being carefully ground after hardening. The clutch is provided with a large ball thrust bearing, to take the thrust when clutch is out. A single spring, easily adjusted, provides the necessary closing pressure on the discs. The whole clutch is so designed that there is no end thrust on the crank shaft when in or out. Special attention has been paid to securing a clutch that releases instantly



and engages without chattering or taking hold too severely. It has a positive release due to the fact that the plates are positively dragged apart by the act of opening the clutch, not left to separate by the uncertain action of numerous small springs. Special attention has been paid to securing very large surfaces of contact between the edges of the discs, thus eliminating the rapid wear of the plates and the rattling due to looseness.

The clutch connection to the transmission is through a double universal joint of very liberal proportions, completely encased and packed in grease. This joint is of the full universal type, not the ordinary squared shaft with loose fitting sleeve and consequent back lash.

### THE CHANGE GEARS.

The transmission is of the selective type, three speeds forward and one reverse. Gears are hardened and ground after hardening. The teeth are six pitch, with seven-eighths face. The shafts are also all hardened and ground. The sliding gears are carried on a hardened steel shaft having four integral feather keys. The transmission case is a single casting with removable bearings and a large detachable cover. Ball bearings are used throughout, with the exception of the reverse pinion and pocket gear, which are of hardened steel on bronze bushings.

Attention has been given to securing a quiet running, easily operated and oil-tight transmission. All shifting rods and connections are enclosed, doing away with leaky stuffing boxes and outside connections.

### REAR AXLE.

The rear axle is of the semi-floating type, shaft driven. The gears are of high grade material, hardened and ground after hardening. The teeth are five pitch. The standard gear ratio is 3½ to 1, 16 and 56 teeth. The gears are mounted on adjustable ball bearings. The outer ends of the axles are on bearings of the roller type, running in hard steel sleeves inserted in the axle tubing. The compensating gear is of the bevel pinion type, all gears and their shafts being hardened.

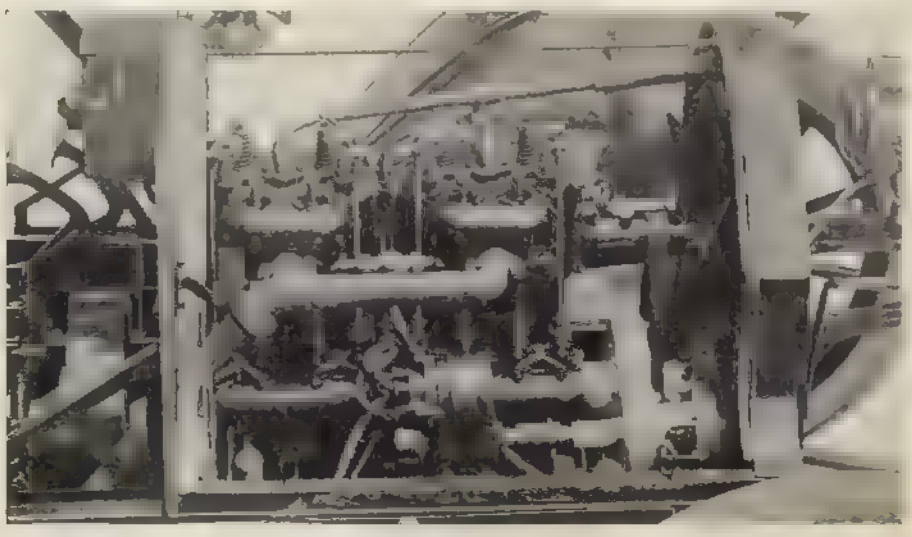


Fig. 4. Exhaust side of the new four-cylinder Reo engine, showing the high tension magneto. Note the light weight bracket which stiffens the dash fan is flat belt driven from the crank shaft. Bore is 4 inch and the stroke 4½ inch. All cam shaft gears are spiral cut. Cylinders are cast in pairs and fitted with cut head valves. H. P. rating 30-35.

The driving gears are easily adjusted to their proper position by simply removing the cover to the rear axle housing, and unlocking the adjusting rings. The torsion tube bearings are adjusted entirely from the outside.

The universal joint between the transmission and driving shaft is enclosed in a spherical steel casing forming the upper end of the torsion tube. The spherical portion of this casing is enclosed in a split bronze ring, sliding in a pressed steel casing bolted to the transmission case. This secures a universal connection between the transmission and torsion tube. The universal joint is at all times packed in lubricant fed to it from the transmission case.

THE TORSION TUBE AND BRAKES.

The torsion arm is a steel tube concentric with and enclosing the driving shaft which is 3½ per cent. nickel steel, hardened and properly heat treated. This shaft runs on adjustable ball bearings.

There are two sets of brakes, external and internal, operating on drums 14 in. diameter, secured to the rear wheels. The driving shaft, axles, torsion tube and all gears are entirely free from any strain due to the application of the brakes.

FRONT AXLE AND STEERING LINKS.

Front axle is an I section one piece drop forging of high grade manganese steel carefully heat treated. The spring seats are forged integral.

The steering spindles are set to make the car self steering, or so it will keep straight ahead. All steering connections are especially large. The bearings are all bronze bushings, fitted with hard pins. Grease cups are supplied at every wearing point. The axle is designed to protect the steering rods and arms. All steering connections are carried above the axle.

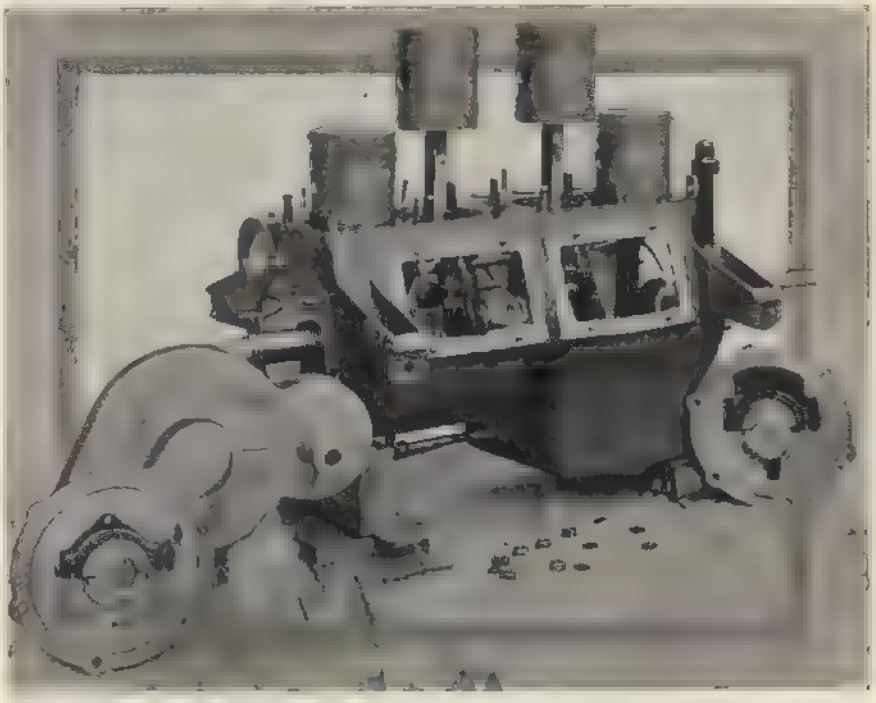


Fig. 5. View of the one piece cast crank case with lateral arms and oil reservoir at the base. It also shows the pistons fitted with three rings at the top and provided with oil grooves at the bottom. Attention is called to the large handholes which give access to the crank shaft and connecting rod bearings.

FRAME.

The frame is of pressed steel, hot riveted, carefully braced and has a drop subframe for supporting the motor and transmission, and is "sprung" over the rear axle in order to allow large spring clearance, at the same time allowing the car to carry low.

Between the sub-frame and side members the frame is filled with sheet steel dust plates. A single piece pressed steel under hood is fastened to the sub-frame by eight locking nuts. The sub frame is carried at a slight angle to the main frame to allow of placing the motor and transmission so as to secure a straight line drive.

The wheel base is 108 inches and the center of the front axle is on a line with the front of the radiator. The rear end of the frame has about eight inches overhang from the rear axle. The motor, trans-

mission and body weight are carried well back, adding to the easy riding qualities.

ROAD CLEARANCE.

There is a clearance of twelve inches under the lowest part of the front axle and twelve and a half inches under the fly wheel with the car loaded. The large wheels, which are heavy artillery type, thirty-four inches in diameter, with twelve spokes, give the car an unusually large clearance and standard 56 in. tread. Michelin quick detachable tires 34x3½ in. are used

The springs are semi-elliptic front, three-quarters elliptic rear, all two inches wide

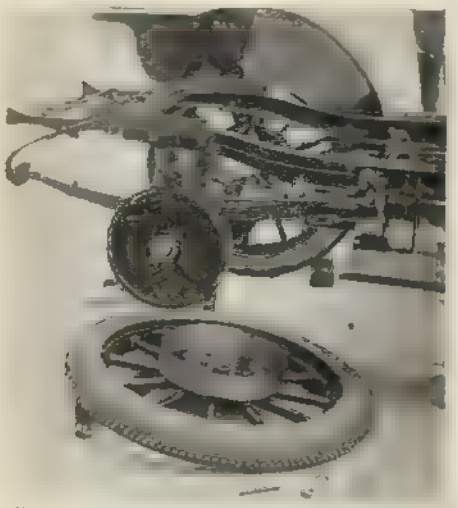


Fig. View of the rear of the 4-cylinder chassis showing the set of brakes on the rear wheel, clipped rear three-quarter scroll end springs and the cranked to members which give large clearance between frame and axle, yet with a low body and center of gravity

Steering gear is of special design, which it is claimed entirely eliminates back lash. A hardened steel bevel pinion and sector of large diameter is used to reduce the motion from the steering wheel. There is but one adjustment.

Steering wheel is sixteen inches diameter, hard rubber rim, mounted on an aluminum spider. The rim has moulded finger grips and will not wear off or get sticky.

Starting crank has four points of engagement on the motor shaft and is locked in a vertical position by a spring check when not in use, doing away with the less convenient leather strap and pocket.

The radiator is of the vertical, flat tube type of very large area, built up in such a manner that it can be easily repaired.

IGNITION

Ignition is by magneto with battery auxiliary to aid in starting, but the car will be equipped with a standard magneto as part of its regular equipment. Provision for attaching a commutator is made. The magneto is attached to its bracket by a single strap, allowing easy removal. The contact points are very accessible and the wiring short and fully protected. A universal joint, packed in grease, is used to connect the magneto to its driving shaft. The magneto drive gear runs in oil inside of the cam gear casing.

Fenders are steel, heavily ribbed and with extension skirts entirely protecting the running boards and motor bonnet. The rear fender is of such shape and size as to entirely protect the top when folded. The fenders are finished in baked black enamel.

The carburetor is of the automatic float type.

The gasoline tank is located under the front seat and is supported by bands passing around it, instead of lugs riveted into its bottom. Its capacity is fifteen gallons.

The muffler is very quiet, and exhausts to the rear. It is equipped with a muffler cut out for high speed driving

CONTROL

The controlling levers and the steering wheel are located on the left hand side. The transmission control levers are of the latest swinging selective type, self-locking when in neutral position. The emergency brake lever is located outside of the transmission control lever and operates the internal brakes on the rear wheels. It also holds the clutch out of engagement when these external brakes are locked. There are two foot levers, the right one controlling the outside brakes, on the rear wheels, the left lever controlling the clutch. A smaller foot lever also controls the muffler cut out. These levers are located in a convenient position, and are easily operated. The spark and throttle control is located on the steering post.

BODY

The body is designed to comfortably carry five passengers. It is of the solid tonneau type, thoroughly upholstered in the best machine buffed leather, and with high grade hair and cushion springs. The tonneau seat is 48 in. wide inside of the upholstering, at the cushion line and the front seat is 40 in. wide inside of the upholstering at the cushion line. The front seat is semi divided, giving the driver and the front passenger ample elbow room. The body is finished in a permanent blue-black, striped with light blue, and fitted with mahogany trimmings and door panels. Special provision has been made for carrying tire tools, pump and jack, in a very accessible position

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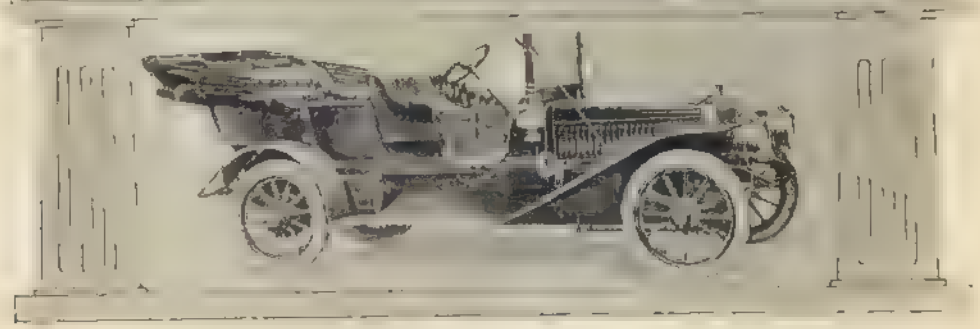
For the first time in eleven years, there will be no motor show in Paris this year, the French manufacturers having by a vote of 79 to 28, decided against holding another show until 1910. This is the result of a disagreement between the Automobile Club of France and the makers.

# THE WINTON SIX



BY D. SCRIBER.

The 48 H. P. Winton Six, now in its third season, and manufactured by the Winton Motor Carriage Co., Cleveland, O., shows remarkably few changes for 1910. Most important of the new features is a four-speed transmission and an enlarged multiple disc clutch. In explaining this change, the company states that the motor, which is identically the same as last year, was found capable of performing more work than had been asked of it, and that the new fourth speed will utilize this excess power, this speed being geared up. The ratio of the first three speeds remains unchanged from last year, and the motor drives direct on third as before. The clutch has been enlarged in diameter to insure the delivery of highest power to the driving wheels

Among the incidental improvements for 1910 is an inswept frame, which permits the car to be turned in short radius. This is all the more desirable now, inasmuch as the wheel base has been lengthened to 124 inches, as against 120 inches last year. The additional space thus provided in the body affords the passengers more than ordinary foot-room, both in front and back. The body is wider than before, and has a low, rakish look. The low effect has been gained by the use of semi-elliptical springs without scroll. The new car carries four shock absorbers and four rubber bumpers, as well as jump straps.

The new car is characterized by a front axle of channel-section pressed steel, of new design. Lubrication is by forced feed as in 1909, and ignition is by Eisemann magneto, with storage battery to supply auxiliary current for starting. The carburetor represents the result of Mr. Winton's long experience in carburetor

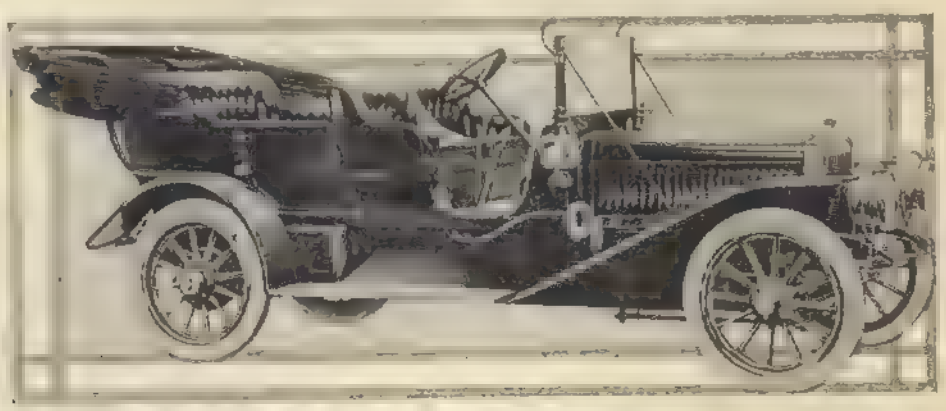


Fig. 1 The [illegible] Six wheel base 124 ins. [illegible] ½ ins., tires 34 x 4 front 34 x 4½ rear, motor, 6 cyl. 48 [illegible] cast ignition system by Bosch or Eisemann dual-tension magneto, 6 cyl. [illegible] multiple disc clutch runs in oil in the same case [illegible] selective sliding gear type four speeds forward and reverse with direct drive on [illegible] control by lever [illegible] weight 4,000 lbs without scroll; both front and rear [illegible] section front axle [illegible] Timken roller bearings through [illegible] equipment, shock absorbers, two gas head lamps, two [illegible] lamps, one oil tail lamp, gas tank [illegible] generator, horn and full set of tools; prices complete $[illegible] with four passenger touring runabout or toy tonneau bodies, $4250 with limousine body, $4500 with landaulet body and $2750 for chassis alone

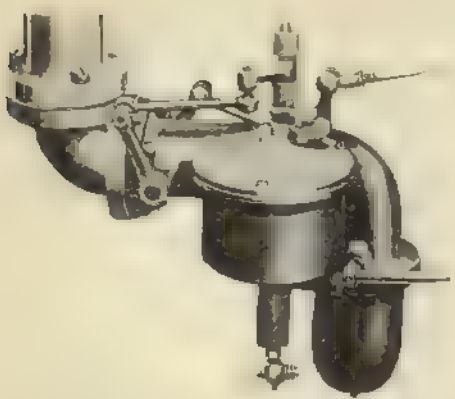


Fig. 2. The "Winton" Single-nozzle Carburetor.

work. It is of the single-nozzle type, without auxiliary air inlet, and is equipped with two throttles, which work in combination. The carburetor may be primed from the dash. The spark and throttle levers have been lengthened, while the steering wheel has been equipped with a hard rubber rim.

At the purchaser's option the car will be fitted with long or short pedals for clutch and brake, and when desired the gear change and brake levers will be placed nearer the seat than on standard equipment. The radiator is of handsomer design than before, and in making this change the radiator tubes were slightly lengthened, as was also the filler. The filler cap is of hard rubber. Solid brake spiders and increased brake leverage are new features. The oil tank has been enlarged, as has also the front universal joint, which is equipped with a lubricant retainer. There are oil cups on the springs. Running boards and guards are wider than before. Rear guards drop over the wheels. Running boards and front floor are covered with pressed aluminum of pyramid design.

The body is of new design, with bucket seats in front, and ample room for three on the rear seat. Large enough to carry seven, the body will be fitted with auxiliary seats when specially ordered.

THE SIX CYLINDER MOTOR.

The motor of the 1910 "Winton Six" has been continued practically the same as last year. The cylinders are cast in pairs with integral water jackets. The water jackets are closed in at the top by a plate, which carries the outlet pipes for the water and connect with the top of the radiator. These plates allow for expansion in case the cylinder water should ever freeze and prevent cracking of the jackets. The cylinders are 4½ in. bore by 5-in. stroke, giving an A. L. A. M. rating of 48.6 H. P. A noticeable feature of the Winton construction is the very thorough manner in which every moving part has been housed, protecting these parts from dust and dirt. All the gears at the front, including the fan driving mechanism, are completely housed, as are also the valve push rods, valve stems and springs; yet all of these parts are in reality very accessible owing to the liberal use of large handhole plates. The very workmanlike manner in which the wiring and small pipes are arranged is also noticeable at a first glance. These features are shown in the accompanying illustrations of the motor. The crank case, as usual, is an aluminum casting. Although the cylinders are cast in pairs, the water jackets completely surround each individual cylinder. The cylinders are finished by grinding and are offset from the crank shaft, equalizing the side thrust on the cylinder walls. The cylinders are submitted to a hydraulic test of 300 pounds to the square inch. The connecting rods are long, reducing the angularity and consequently the side thrust. The pistons are also very long and fitted with three eccentric rings, assuring in connection with ground cylinders; good compression. Attention is given to making all pistons, rings, connecting rods, and wrist pins of the same weight, thus assuring perfect balance.

The cam shaft is of liberal size and mounted in bearings, the surface of which are ground. A single cam shaft is used operating all of the interchangeable, large sized, nickel steel valves. All cam shaft gears are enclosed. These are of steel, as well as those driving the fan and are of the spiral type, to reduce the noise. The cam shaft is removable through the front of the case without removing the valve springs, push rods, or rollers, or destroying the valve adjustment.

The six throw crank shaft is made of specially treated nickel steel, of about 125,000 pounds per square inch tensile strength. This shaft is mounted in four large Parsons' white brass bearings.

The crank case, as in previous Winton construction, is divided into right and left halves so that it is possible to remove the

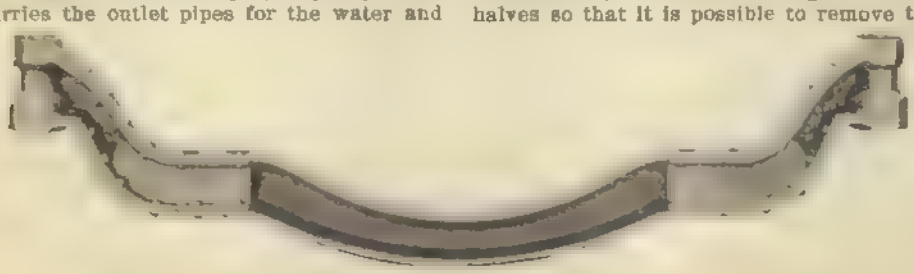


Fig. The channel section pressed steel front axle now used on the Winton Six.

crank shaft, connecting rods, and pistons without disturbing the cylinders, or the accessories. A drain is supplied at the bottom for flushing out the oil chamber.

THE SELF STARTER

An exclusive and valuable feature of the "Winton Six" is the compressed air, self-starting device. The Winton carries its starting crank in a tool box to be used only in emergencies, the same as other tools; the arrangement is simple but effective. A small pressure tank placed between the left frame rail and the driving shaft is charged by means of small portions of the gas from cylinders one and six. Here the pressure is stored until needed to start the motor. By turning a small cock this gas flows through a rotating distributor, forcing one of the pistons down and at the same time one of the other pistons passes the firing point, and the motor starts. If for any reason this cylinder fails to fire the distributor sends the pressure to the next cylinder in order and thus forces the next piston past the firing point. This process continues through the series of cylinders several times until the motor starts. There is but one moving part, the distributor valve, which is readily lubricated and, it is said, practically never gets out of order.

A slight click in the gauge on the dash has been eliminated in the 1910 models by the use of a small check valve which is placed vertically in the air line. On the dash are arranged the pressure gauge, which shows the pressure in the tank, a push button, which allows pressure to flow to the cylinders, and a shut off valve, for use when the car is to remain idle for a long time, thus preventing the escape of pressure from the storage tank.

A feature of the Winton equipment, which appeals to all motorists, and especially to tourists, is an attachment to the self starting device, by means of which the tires can be inflated without any manual labor. A tube, supplied with the car, is attached at one end to the self-starter cock on the dash and the other end can be connected to any tire to be inflated

CARBURETOR

The carburetor is of the float feed, single nozzle, but double throttle type; that is, a throttle controls the air inlet and works in unison with a throttle controlling the flow of gas to the engine. There is no automatic air valve. Throttling is done mechanically by lever from the steering column, or by a foot button, which acts as an accelerator and is located under the driver's right foot. A priming device is also placed conveniently on the dash.

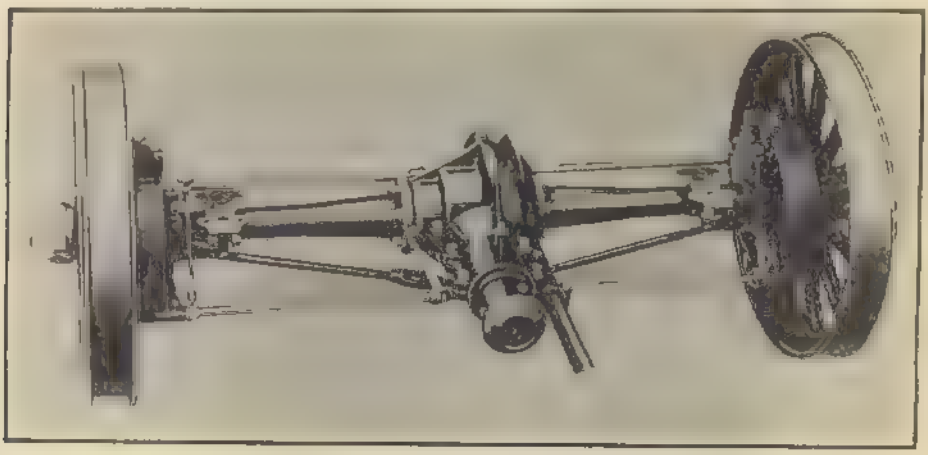


Fig. 4. The full floating Winton rear axle

LUBRICATION

The crank shaft receives oil by means of a pump operated by an eccentric on the rear end of the crank shaft; oil being drawn by a tank at the left side of the motor and delivered to the main bearings and to the front gears. A continuous sight feed is placed on the dash. The overflow from the main bearings provides a splash pool, which takes care of the cylinders, and a second pump, operated by the same eccentric, draws oil from the case and passing it through a strainer returns it to the oil tank. The flow of oil is proportionate to the motor speed and the quantity is regulated by a by-pass. Oil grooves in the cylinders and pistons distribute the oil on the cylinder walls.

THE CLUTCH

The transmission gears and the multiple disc clutch, in accordance with approved practice, operate in an oil bath. This clutch is tested to transmit 90 H. P. at 1000 R. P. M. It has sixty seven steel friction plates, thirty-three of which are attached to the transmission shaft, and thirty-four to the driving spiders, which are connected to the fly wheel. The clutch

discs have been increased 50 per cent. in diameter over previous years. The clutch is carried on annular ball bearings and there is no end thrust on the bearings when the clutch is engaged. The discs are forced together evenly by four springs, placed at equal distances. A clutch is contained in the transmission case and is accessible through a handhole. An arrangement is made so that the clutch pedal cannot be locked with the clutch out of engagement, thus making it compulsory to place the cars in neutral position when stopped. The clutch and hand brake are inter-connected. The clutch mechanism is compact, requires but slight foot pressure to operate, and can be readily removed.

Fig 3. Motor of the 1910 "Winton Six." Cylinders cast in pairs, with [illegible] ing between cylinders. Cylinders 4½ in. bore by 5 in. stroke. A. L. A. M. [illegible] to the complete housing of every moving part except the fly wheel and the [illegible] and small pipes. The aluminum crank case is divided into two lateral halves [illegible] the crank shaft, pistons and connecting [illegible] the steering knuckle arms [illegible]

THE CHANGE SPEED MECHANISM

As previously mentioned, the car has now four forward speeds and a reverse, with a direct drive on the third speed through an internal and external combination. The change speed mechanism is of the sliding gear type with selective operation, permitting any gear change without passing through any intermediate speeds. It is impossible to engage any new set of gears while the clutch is engaged; the lever being in neutral position. The shifting rods and levers, and the inter-locking mechanism are entirely enclosed in the transmission case, assuring freedom from dirt and preventing the dripping of oil. The clutch is contained in the same case and the whole assembly is placed close to the motor.

The side rails of the frame, which is of the usual pressed steel construction, have been increased four inches, making them one hundred and seventy inches in length. The drop channel section frame members are also of pressed steel and their intersections with the main frame are braced with heavy gusset plates. The motor, clutch and transmission are carried on these drop frames, no sub-frame being used.

The steering mechanism is of the screw and nut design, having ample bearing surface and liberally equipped with ball thrust bearings. The steering links are adjustable and the steering knuckles are mounted on roller bearings. The joints of the steering connections consist of a heavy bolt with a bushing, secured by a nut and large cotter pin. The steering lever and steering gear are held in place by a large taper pin. The steering wheel rim is of hard rubber.

A NEW AXLE

The front axle is an entirely new creation, being of channel section pressed steel; claimed to be of great strength. This is shown in one of the accompanying photographs. The ends are heavily reinforced by channel section drop forgings, the ends of which carry the steering pivots. The rear axle is of the full floating type, no load on the driving shafts, which simply transmit torque to the wheels. The weight of the car is carried on the heavy drawn steel tubular housing, which surrounds the axle. This construction permits of the removal from the car of the axle shafts, differential, and its bearings, with the car standing on its own wheels. A spur gear differential, using drop forged, nickel steel pinions, is employed. The entire construction is mounted on Timken roller bearings.

The drive is by shaft fitted with two roller type universal couplings, each of

which is enclosed in a grease tight metallic case, fitted with plugs for replenishing grease; these important members thus being surrounded by lubricant. With the car normally loaded, the driving shafts are practically horizontal. An improved flexible coupling, consisting of a split housing engaging the square end of the transmission shaft and a similar steel square bolted to the fly wheel, is interposed between the motor and transmission. The entire driving mechanism is completely housed. Needless to say, the car has no chains anywhere in its construction

There are four brakes with solid spiders on the rear axle, two of these are internal and two external The brakes are of large size, and in the 1910 models have been given increased leverage. Equalizers are employed, and it is claimed the brakes hold equally well in either direction.

SPRINGS

The springs for 1910 are of the semi elliptic type, without the scroll end formerly used. The same type is used at the front and rear, and permit a lower suspension of the body than in previous models. A special friction shock absorber is provided on each wheel, as are also rubber bumpers and jump straps The springs are held to the axles by means of a clip, bolts from which pass through the axle bed. There are no holes through the spring leaves, thus minimizing the danger of spring breakage. A radius rod extends from each frame rail back of the centre of the car to the spring seat. These rods are pivoted and hold the rear axle in its position, at right angles to the frame; they also transmit the propulsive effort of the rear wheels to the frame. Extending from the rear axle to a cross member of the frame is a torsion rod, the forward end of which is allowed, by means of a link with ball joints at each end, a limited amount of movement.

Thirty-four inch wheels, twelve spokes each, made of well seasoned material, are fitted with four inch front tires, and four and a half-inch rear tires. The regular equipment consists of Goodrich Quick Detachables.

A twenty-two gallon gasoline tank, of rectangular pattern and fitted with a gage, is placed at the rear. It contains, in a separate compartment three gallons, reserve supply, which is guaranty against being stranded for lack of fuel. The gasoline is forced under two pounds pressure, maintained by an automatic air pump, to a patented auxiliary gasoline tank placed on the dash, from which the fuel flows by gravity to the carburetor. This obviates the necessity of ever having to force gasoline direct from the main tank to the carburetor by a hand pump.

BODY

The body of the "Winton Six" is, as usual, very large, roomy and well finished It has good lines and a very stylish appearance. It is of wood construction throughout and highly finished. The body is noticably lower than Wintons of previous years. The tonneau is wide, very roomy, and fitted with doors of ample width. The upholstering is soft-edged and extra deep. The front floor is covered with stamped aluminum and a floor mat is used in the tonneau. Instead of using a foot rest, the tonneau floor is depressed just in front of the rear seat, so that the feet of the occupants rest in a natural position on this inclined surface; the position being very comfortable. Many other little conveniences have been arranged, among which may be mentioned a new tonneau door latch, which can be opened from the inside, doing away with the necessity of reaching over to the outside to unlatch the door

The motor, radiator, tanks, ignition apparatus, etc., are so arranged that any type of special body which the purchaser may desire can be fitted. The dash is of mahogany and carries the auxiliaries previously mentioned. The bonnet is of aluminum, quadruple hinged and locked at the sides by means of spring plungers. The guards are of graceful and sweeping design, and fitted with shields, extending between them and the frame, and between the running boards and the frame. These boards are covered with stamped aluminum. A dust pan extends from the forward end of the motor to the rear of the transmission, and an apron extends from the radiator to the pan, thus fully housing the under-side of the car. There are drawer lockers under the front seat, and storage spaces under both seats.

The price remains unchanged at $3000 for the 48 horse-power Winton Six when equipped with either touring car, runabout or toy tonneau body. When equipped with limousine body the price is $4250, and with landaulet body $4500.

For the third successive season the Winton Company will manufacture sixes exclusively. In addition to the 48 horse power car, there will be a 60 horse power Winton Six at $4250

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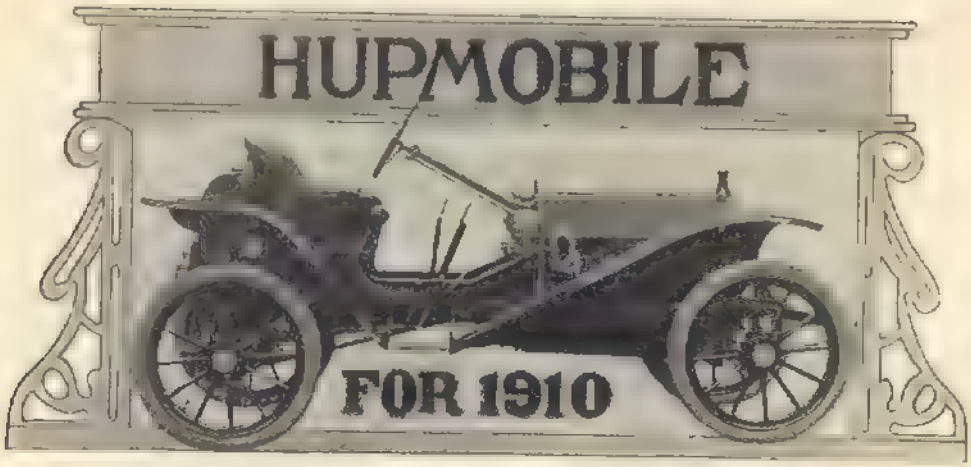
**The Indiana Motor Sales Company**, Indianapolis, Ind., has purchased the output of the Indiana Motor and Manufacturing Company for the season of 1910. The name of the new car manufactured by the latter concern is the "Continental 35," and is a five-passenger touring type, which will retail at $1400.




March 1st, 1909, the Hupp Motor Car Company, of Detroit, started delivering a light 2-passenger runabout, and by the middle of August had completed the construction and shipment of its season's output of five hundred cars. Long before the finish of the 1909 season they had several experimental cars of the 1910 model on the road, giving them exhaustive tests under the most trying conditions, and by the time the final cars of the 1909 season were nearing completion the 1910 model had been thoroughly tried out, received the O. K. of Mr. Nelson, the chief engineer, and the construction of them was well under way.

This company is now occupying its new factory, which is of the most up-to-date construction of concrete and glass with nearly 60,000 square feet of floor space and embracing all the latest features of the modern automobile factory for the production of cars in quantity without sacrificing high standard of workmanship.

The cars of the new model, which is known as Model "B", are being turned out at the rate of thirty a day in an effort to supply the phenomenal demand for this handsome little car, and it is the intention of the manufacturers of the Hupmobile to build no less than seventy-five hundred cars for the 1910 season.

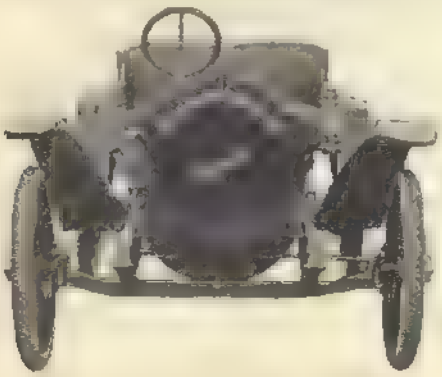


Fig 1. Front view of the 1910 Hupmobile.

This attractive runabout, while of original design throughout, follows what is conceded to be the most approved practice in motor car construction. No radical changes have been made in the new model. It retains the same racy lines that have made this little car famous. Continuing their policy of last season, the company will confine their efforts to the construction of one model only, the mechanical features of which, and the changes and improvements over the 1909 car, are given in the accompanying description.

### GENERAL CONSTRUCTION

The wheel base is 86 in. with a standard tread and 30x3 in. G & J tires are used. While the car, as shown in the headpiece, sets very low the road clearance is ample, being 11 in. under the axles and 13 in. under the fly wheel. The standard color is "Hupmobile Red" with black moldings and hair stripes. The upholstering is plain black machine buffed leather, padded to support the lower back and still leave the shoulders free. The seats of the new model are somewhat wider than those of last year and the backs are slightly higher, which makes for greater comfort to the passengers. The cushions are 4½ in. at the front and 3 in. at the rear. Plenty of foot room is allowed, as there is 28 in. from seat to dash. The 15-inch steering wheel is finished in mahogany and the dash of the new model is of Circassian walnut. The hood is three-hinged, 30 in. long, clamped in place by four lever hold-down clamps journaled in metal bushings in the side hood strips. A polished aluminum ledge supports the hood at the dash.

One of the features which will be immediately noticed in the appearance of the new model is the adoption of an oval gasoline tank mounted on the body with its greatest diameter in a vertical position.

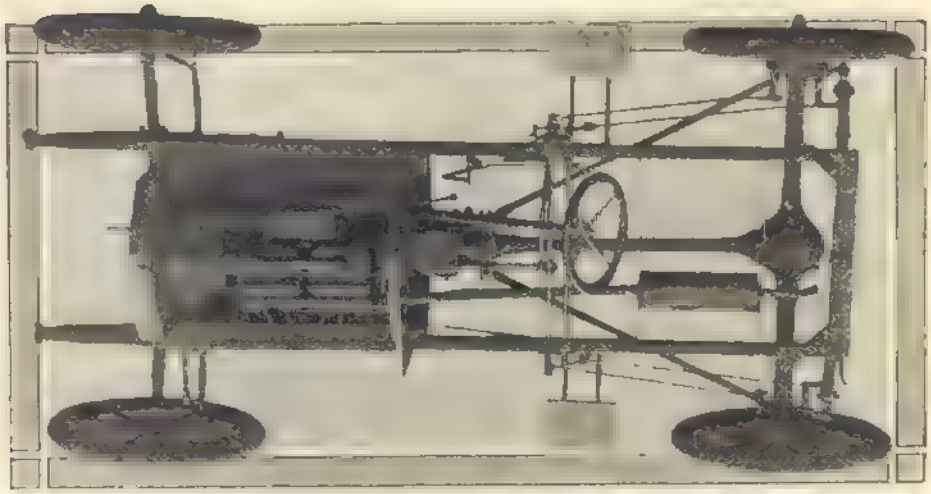


Fig. 2. Right view of the Hupmobile for 1911. Wheel base 8[illegible], tires 30 by 3 in., motor four cylinders, 3¾ by [illegible], 16 20 H. P., cylinders cast in pairs, valves all on one side, [illegible] ignition by Bosch high tension magneto, lubrication by splash and [illegible] cooling by thermo-syphon system, multiple disc clutch, selective sliding gear transmission, two speeds forward and reverse, two sets of internal expanding brakes on rear wheels, semi elliptic springs in front and platform in rear.

This tank has a capacity of 11 gallons and is carried at the rear of the seat at a sufficient height to insure plenty of gasoline on all hills. The car complete weighs 1100 pounds, and is capable of a speed of 50

Fig. 3. View of the left side of the motor of the 1910 Hupmobile, showing the location of the magneto, carburetor and intake and exhaust manifolds.

miles per hour. The price remains the same as last year, $750. This price includes oil lamps, tools and full equipment for the road.

THE POWER PLANT

The 4-cylinder motor, shown in views 3 and 4, has a 3¼ in. bore by 3⅜ in. stroke, and is rated at 16 20 H. P. The crank shaft which is of 30 point carbon steel is 1¼ in. diameter with a ⅜-in. offset from the center of the cylinders. The forward end is tapered to carry a 40 pound helical bladed, 14-in. fly wheel that is clamped on a taper by a 2-jaw hardened starting crank nut. The starting crank is journaled in a casting bolted to the front cross member of the frame and is held out of engagement by a helical spring. The drop forged connecting rods are of "H" section and the caps are held in place by two bolts which are cotter pinned after the nuts are tightened in place. The rods are bushed with Parsons' bronze, hand scraped to a bearing, and the caps have oil scoops on their lower side. The bone hardened and ground piston pins are a drive fit in rods locked by cone-pointed set screws and bear in the pistons. The pistons are 3⅝ in. long, taper ground, with an oil groove ⅞ in. wide for the lubrication of the piston pins. Three eccentric bevel split packing rings are used, made of special analysis, hard, close grain iron, ground on three faces. The valves are 1½ in. in diameter, 45 degrees seat with nickel steel heads electrically welded to carbon stems and ground all over. All valves are on the left side with spark plugs over the inlets. The priming cups are over the exhaust valves. Inlet and exhaust headers are of cast iron held with four clamps and packed with copper asbestos gaskets and centering rings. The inlet header has a chamber that extends from the lower air inlet of the Breeze carbu-

Fig. 4. Right side view of the Hupmobile motor assembly showing the cyl[illegible] with right heads and the water manifolds leading to and from the water jackets.

retor up to the exhaust header, preventing condensation and delivering warm air around the spray nozzle. A one-inch pipe plug can be removed from the lower part of the hot air duct, allowing a direct air inlet to the carburetor for summer use.

Fig. 5. The one piece drop forged cam shaft in the five bearing side plate, together with the [illegible] cam shaft and the [illegible] bolts the valve [illegible]

CAM SHAFT AND CAMS

A one-piece, drop forged, bone hardened and ground cam-shaft is babbitted in place in a cast iron side plate shown in Fig 5, which extends the full length of the motor, and when removed gives free access to the connecting rods. This shaft has five bearings open to the splash of oil in the crank case, and as the babbitting in place produces a perfect alignment of these bearings, they should wear indefinitely without shake. The valve tappets also have their bearings in this plate. They are ⅝ in. in diameter, bone hardened and ground. The cam contact end is milled on a radius giving practically the same effect as a roller and eliminating all possibility of lost motion incidental to the construction where a roller is used. The tappets have gray fibre inserts where contact is made with the valve stems, insuring quiet valve movement. A bearing ring on the end of the valve stem insures ample bearing surface on the valve tappet, thereby practically eliminating all wear at this point. The cam-shaft gear is of gray non swell fibre backed on the sides with steel, and meshing with a crank shaft and magneto gear of steel. The centres of the gears can be adjusted by varying the thickness of the gasket used and thus a quiet gear can always be obtained

TIMING THE MOTOR

In timing a new motor, the side cover is bolted in place, with the proper teeth in mesh, a clamp is then put on where the magneto gear meshes which holds the gear fixed in relation to the side cover; it is then unbolted and put in a timing jig on the bench and the cams ground with a small emery wheel to the correct opening and closing of the valves. Very little grinding is required at this point as the profiles of the cams are very accurate and all that is required is to correct the slight variation incident to babbitting the shaft in place. After this grinding operation the side cover is put back on the motor, and if necessary, the valve tappet fibres are filed to secure the required clearance between the tappets and the valves. This system has been found very rapid and accurate, as all slight errors in placing keyways and the slight warping of the camshaft in hardening are eliminated.

THE IGNITION

A Bosch high-tension magneto with fixed ignition is mounted on a ledge on the side cover and driven by a housed gear keyed on the armature shaft and meshing with the fibre cam-shaft gear. Five wires lead from the magneto, one to each spark plug, and the remaining one to a switch on the dash where the current is short-circuited to cut out ignition. This switch is the only operative device on the dash

UNIQUE OILING SYSTEM

The oiling system is by splash with level drains. Oil pockets are provided over the Parsons' bronze engine and transmission bearings with a return oil drain on the front fly-wheel bearing. The two crank case compartments provided with level drain cocks are fed by an oiler cast integral with the inlet water header. This oiler which is an improved type of that used on the previous model has two plungers held to seats at their lower ends by springs. On the upper ends of these plungers are mounted rollers which bear on an operating bar extending through elongated slots in the plungers. This bar is positively connected with the carburetor throttle control mechanism by a ball and socket joint and is provided with graduated cam dwells on the upper side at the points where the rollers bear. As the throttle is opened the position of this bar is altered

and greater heighth of cam is presented, thereby lifting the plungers off their seats and allowing the oil to run through in the crank cases. Adjusting nuts on the tops of these plungers permit of very accurate setting of the amount of oil fed. This system of connecting the oiler with the throttle mechanism insures an absolutely positive feed in the amount required, i. e., from an entire cessation of feed when the throttle is closed to a maximum feed when the throttle is wide open. Either one of the engine compartments may be flooded by lifting these plungers off their seats, obviating the necessity of pouring oil down the vent tubes. Before entering the crank cases the oil passes through sight feed glasses.

RADIATING SYSTEM

The thermo-syphon system of radiation is employed, using about three gallons of water. The general construction of the radiator is the same as used in 1909, but the number of vertical tubes has been increased from four to five and the intermediate tank has been enlarged. These changes have greatly improved the efficiency of the radiator and entirely eliminated any tendency of the water to boil. A high filler tube showing a slightly bellen taper adds a pleasing finish to the radiator The outlet from the motor enters a tank eight inches from the top of the radiator. This tank extends across and half way through and is not visible from the front. The hot water entering this must pass upwards through the tubes four inches in length, which is sufficient to prevent steaming. Two studs in the bottom of the radiator fasten it to the front frame cross member, while a tie rod braces it to the dash at the top. One petcock drains the entire water system.

FIXED SPARK

The carburetor is controlled by an accelerator pedal and can be set by a hand lever under the steering wheel. There is no spark control, as the magneto is set with a slight advance and generates a hotter spark at high engine speeds. This has been found satisfactory in France, where fixed magneto ignition is used on 44 per cent. of the cars, contributing more toward the life of an engine than fine workmanship and cuts out at one stroke the "bugaboo" of four-cylinder engine ignition.

CLUTCH AND CHANGE GEAR

The most noticeable change in the mechanical construction of the 1910 Hupmobile is the adoption of a multiple disc clutch shown in Fig. 6. This clutch has nine plates of saw blade steel and is contained in the transmission case running in an oil bath. The transmission case of cast iron is bolted to the crank case and is of rigid construction. The clutch is thrown out of engagement by a pedal pivoted to this case.

The sliding gear transmission, also shown in Fig. 6, has a low speed ratio 2.7 to 1, with a direct drive on high. The toggle operated reverse pinion has the same ratio as the low gear.

There is one neutral position of the side control from which any gear can be meshed. The movements are back for low, forward for high and to the side for reverse. The gears are of 20-point carbon steel, bone-hardened and drawn in oil. The tooth is a generated eight pitch, 10 depth, 20 per cent. involute of ⅝ and 11-16 in. face. The counter-shaft gears are riveted to a bronze hub that journals on a hardened and ground shaft. The hardened, splined transmission shaft also carries the clutch and has a bearing in the clutch drum at its forward end and the direct drive gear hub at the rear. The latter has

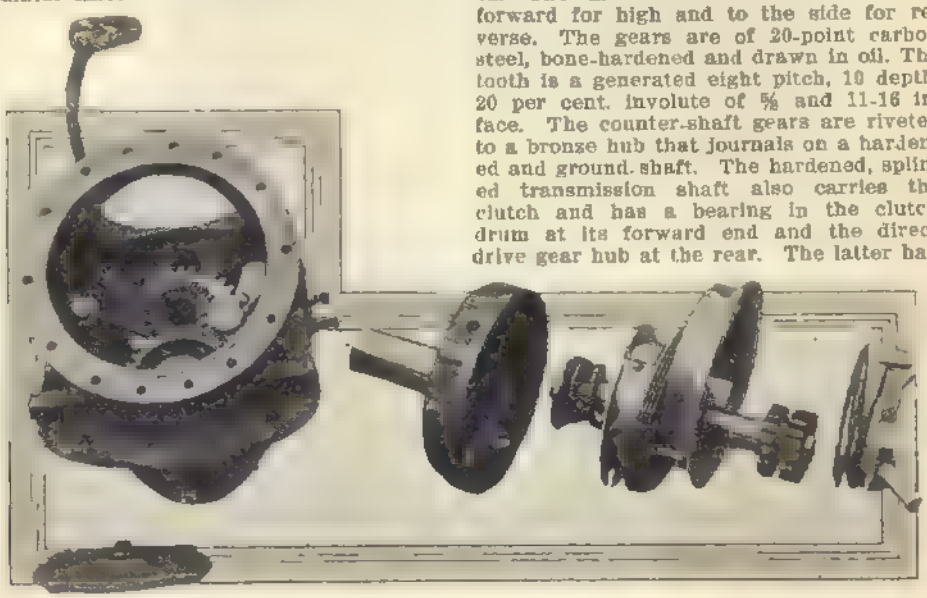


Fig 6 Sliding gear transmission and multiple disc clutch disassembled, the transmission gives two speeds forward and reverse. The transmission shaft carries the clutch, which is formed of nine plates of saw blade steel and runs in an oil bath.

a long Parsons' bronze journal in the transmission case and is broached square to take the male end of the universal joint.

The rear end of the gear case has a large cylindrical bearing that fits over the spherical universal housing of the propellor shaft, making a dust-proof joint and taking the torsion of the rear axle. Two ball end radius rods extend from the rear brake supports diagonally up to sockets in the transmission case, making a very flexible construction.

REAR AXLE ASSEMBLY

The rear axle is of great strength. The 2½ in. by 7-32-in. wall steel tubing is pressed and riveted in a well-ribbed bevel gear housing, no truss rod being used. The axle shafts are 1⅛ in. diameter, of cold drawn piston rod steel journaled on Hyatt bearings at the wheels and large shim adjustment two-point ball bearings at the differential case and propeller shaft.

The drive pinion and small bevel differential gears are of 3½ per cent. nickel steel, bone-hardened; the large gears meshing with these are of 30-point carbon steel, bone hardened.

The bevel drive gear and pinion are of 48 and 12 tooth respectively and the teeth are six pitch 20 per cent. generated. The 12 tooth pinion is electrically welded to the drive shaft, the rear end of which is supported on a "New Departure" ball bearing which takes both radical and thrust strains

The front axle shows a change from the one formerly used. A drop forged 40 per cent. carbon steel, heat treated deep "I" beam section having an angle drop from the ends and the yokes forged integral is now used in place of the tubular built-up axle which was used on the model "A". The drop forged steering spindles are 1 3-16 in. diameter mounted with two point adjustable ball bearing.

BRAKES AND SPRINGS

The four internal expanding cam actuated brakes are lined with Thermoid. Two are used side by side on each rear wheel and are interchangeable. A pedal operates one set and a hand lever the other.

The inverted double sweep rear cross spring has a ball socket clipped in the middle, taking a ball-ended taper shank bolt that seats in a bracket in the middle of the rear cross frame channel member, giving the frame a three point suspension.

The eyes of the spring are pivoted to sliding journals having a bearing on a cross bar parallel with the axle and supported by arms extending rearward from brake supports. Behind each journal is a compression spring that exerts a pressure outward, tending to deflect the cross spring and accelerate its deflection but retard the rebound. The front springs are semi-elliptic, 34 inches long, hung with compression shackles at the rear.

The fact that the frame is mounted on a ball allows of a certain gravity swing that is, of course, no faster than can be followed by passengers in the car, so there is seldom a rebound of enough magnitude to lift the weight of a passenger from the cushion.

STEERING GEAR.

The enclosed stearing gear is the rack and pinion design. Both gears are bone hardened. Contrary to most designs of this type, there is no bending movement in the rack as it has a straight line connection with the axle steering arm by means of a drag link with heavy adjustable ball sockets at both ends, one of which encloses a helical recoil spring which absorbs all ordinary road shocks. With this construction no movement of the steering wheel is perceptible when the springs are deflected. The steering gear housing is riveted to the front cross member. The steering wheel shaft bears in this and extends backwards at a rakish slant to the aluminum spider of the steering wheel. A tube houses the steering shaft from the dash up to a terminal bearing that carries the hand throttle lever.

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The Rohrbacher Automatic Air Pump Co., formerly of Blaine, Wash., announce that they have moved into larger quarters owing to the demands on them for their auto power tire pumps. They now have a completely equipped plant at Portland, Ore., capable of producing six times the former output.

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The Swinehart Clincher Tire & Rubber Co., of Akron, Ohio, notify the trade that they are owners of a tire patent granted to Edwin B. Cadwell, on cushion tires, and that in general cushion tires, having recesses in their side and presenting an unbroken tread surface are an infringement on the said Cadwell patent.

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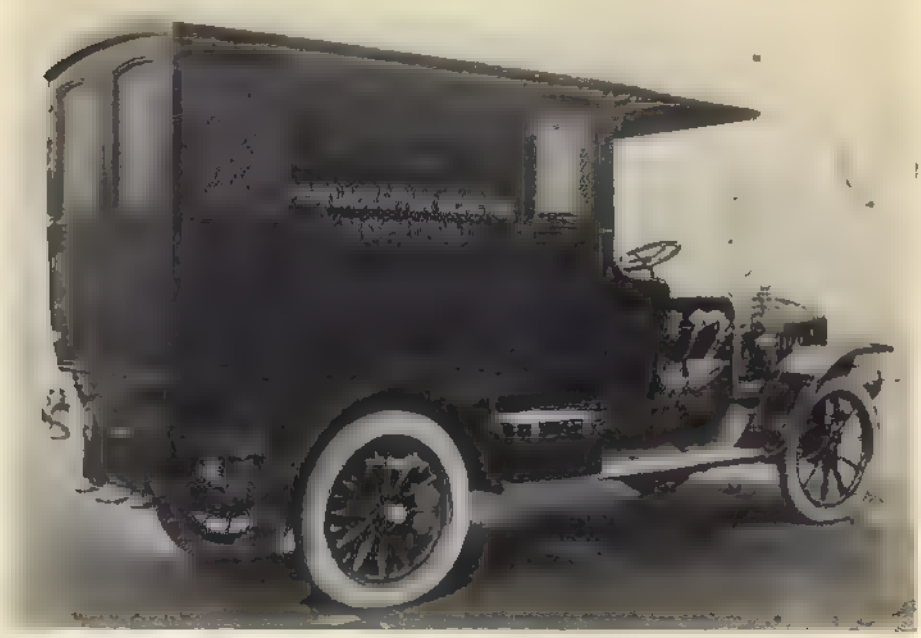
"One hundred and thirty-five thousand new cars for next year will be about the actual output," said tire manufacturer H. S. Firestone in a recent interview. "This estimate we have not based upon the published claims of the makers, but upon the specifications of their purchasing departments, and car makers are not prone to buy more tires for their new cars than they must have. A great many progressive makers have for the first time adopted demountable rims as part of their optional equipment. One of the leaders has gone so far as to include, without extra charge, demountable rims on all cars."

# The Motor Car in Police and Hospital Service

The fact that auto ambulances, patrols and fire appliances are gaining in popular favor and the assurance that they are a marked improvement over similar vehicles of the horse-drawn variety is demonstrated by the adoption of them by the government, and various municipal authorities. The advantages of the auto are so clearly defined that a great many municipalities have either contracted for, or are seriously considering installing a motor car of whichever class of public service vehicle they may need most. Quite a few have already tried them and found them satisfactory; some others also have them, but for too short a time to be able to pass upon their qualities

"RAMBLER" COMBINATION AMBULANCE AND PATROL FOR HARRISBURG PA.

The city of Harrisburg, Pa., now has a combination ambulance and police patrol. This car, which was delivered about July 1st, consists of a special body built upon a Rambler 45 horsepower chassis. It has a clearance inside of 7 feet and affords room for four patients at a time. The body is high enough for a man of ordinary size to stand erect, and has a floor of double oak separated by asbestos. A large electric light occupies the top. When in use for patrol service full length seats occupy both sides, with extra seats in front and rear supplying accommodations for eleven patrolmen and the driver. There are triple wire screen doors in the rear, allowing the entire back to be thrown open when the wagon is used for ambulance purposes. The first real test of this machine was on Monday, July 5, when the car was doing both ambulance and patrol duty practically all day, to and from various points in the city and taking the Market street and Derry street hills with apparent ease.



Ambulance used by the Philadelphia General Hospital This is a specified body mounted on a 30 H. P. 1908 stock "Model K" White steam chassis

The White Co. recently made delivery of a White steamer fitted with a patrol wagon body to the police department of Omaha, Neb. With three shifts of drivers, this machine has been put into 24 hour service, in which it replaces six horses, doing the same amount of work in less time and at lower cost.

At Lansing, Mich., it is claimed their auto fire engine has responded to seventy-one alarms in 136 days, at a total cost of only $24.81.

A second automobile patrol has already been put into service by the Indianapolis Police Department.

PHILADELPHIA HOSPITAL USES WHITE CARS.

The Philadelphia General Hospital, Thirty-fourth and Pine streets, Philadelphia, Pa., is now using two self-propelled

White steam ambulance in use by the U. S. Naval Hospital at Philadelphia. The body was built from specifications and mounted on a 30 H. P. 1908 stock "Model K" chassis.

ambulances. These cars are White steamers with regular stock model chassis and have special bodies, built according to specifications. The bodies on both ambulances are similar in every respect. They are of wood construction, are padded on the inside, and equipped with electric dome light

The first car was purchased in the latter part of 1905 and has been in continuous service both night and day until about four months ago, when night service was discontinued. It is a "Model F" 18 H. P. stock chassis. The car itself weighs about 3500 lbs., and loaded to its capacity of 9 patients, doctor and chauffeur will weigh close to 5000 lbs. This car cost $3200.

Interior view of the White car in use at the U. S. Naval Hospital at Philadelphia, showing arrangement of hooks and straps for supporting the stretchers, two being placed side by side, and two more rolled in on the floor.

The other car is a standard model chassis having a 30 H. P. engine, and was purchased in 1908, at a cost of $4500.

The cars are both giving entire satisfaction. With the first car there was very little mechanical trouble and that was caused mostly by the abuse the car received due to the inexperience of the operator

With the 1908 Model "K," 30 H. P., there has been no mechanical trouble whatever. Neither car has experienced any tire trouble to speak of, nor has ever been tied up on the road.

The hospital authorities claim the steam ambulance is much more satisfactory for hospital use than other makes, on account of the easy riding qualities possessed and the lack of noise and vibration Either car will do the work of three two-horse drawn vehicles. Such minor repairs as have been necessary are made by the chauffeurs, and even in the case of overhauling, when the heavy machinery was taken out and repaired, the car was taken to a shop and the work done there by the operators.

### COMPARATIVE COST

The first cost of the two cars was $7700 These two cars displace 6 pairs of horses, which at the present average cost of $500 per pair, would amount to $3000. The cost of six ambulances would be about $2700. This gives a total, for the horse

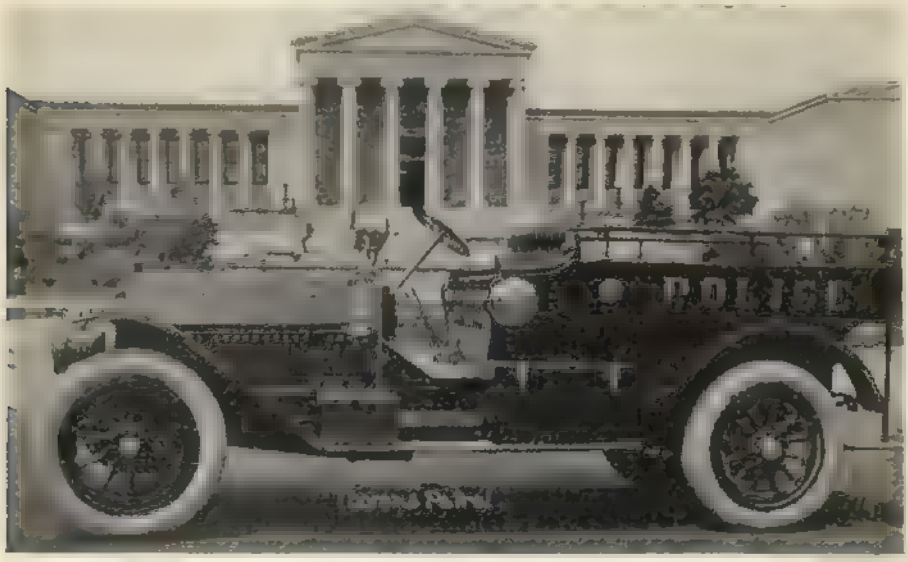
drawn vehicles displaced by the ambulances, of $5700. That figure, however, cannot be compared to the cost of the motor cars, as the motor cars work both night and day, while the six pairs of horses would not give a continuous hospital service of even a day.. To make a fair comparison of first cost, one must estimate on at least 12 pairs of horses which, computed on the same scale, will swell the total to $8,700. Then, again, although the wages of the former drivers were the same as those of the chauffeurs, it took 12 drivers for the horse-drawn ambulances, while for the present motor vehicles only 4 operators are required

These cars make as high as 120 miles apiece on some days, and average about 80 miles per day, which, together with the other advantages they have over horse-drawn ambulances, give such satisfaction that the hospital authorities say, that were it possible, at this time, they would do away with the horse-drawn ambulances altogether

CINCINNATI POLICE USE "THOMAS" PATROL

A radical departure from the strict lines of automobile construction by the E. R. Thomas Motor Company is the self-propelled police automobile used by the city of Cincinnati.

This machine is finished in dark blue with black points, and all metal work, with the exception of the rail around the body of the machine, which is black, is finished off in highly polished silver nickel. The side lights are eliminated and the regular police lanterns substituted on the dash. It is also equipped with large head lights fed from a Prestolite tank which is incased in a black leather cover to match the body of the machine. There is also a fourteen inch searchlight which is bolted to the dash. Along the running board on the control side are two large boxes joined together by an invisible joint, which contain medicine kits and other necessary apparatus. The running board on the opposite side has repair parts and tool kits, etc., the Prestolite tank also being on that side.




Thomas' 6 cylinder 70 H. P. Auto Patrol in use by the City of Cincinnati, O.

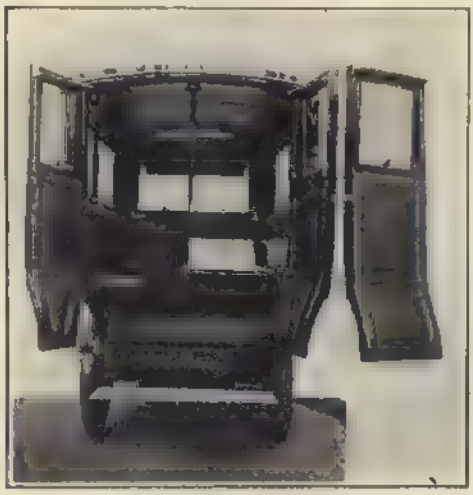
A part of the equipment consists of stretchers, crow-bars, an axe, nets and other accessories which are indispensable to the perfect equipment of a vehicle of that character. This auto patrol is a 6 cylinder 70 horsepower machine built on the regular chassis, put out by the Thomas Company, and purchased for the city of Cincinnati by Chief Milliken, who came on with Colonel Casey, the Commissioner of Police, to attend the convention held in that city. A demonstration of this machine to various police chiefs resulted in five orders for machines similarly constructed and equipped.

The first test of a self-propelled piece of fire apparatus by the City Fire Department was recently held in Buffalo. Those who rode in the machine during the test were Chief McConnell, Assistant Chief Murphy, Commissioners Machemer and Persons, and A. C. Webb, vice-president, and J. Napier Dyer, general manager of the Webb Motor Fire-Apparatus, of Vincennes, Ind., the makers, and eight firemen.

The machine was run from fire headquarters to the pipe line at Washington and Broadway, where a stream of 1¼ inches was thrown 200 feet under 235

pounds pressure. The engine is equipped to throw two streams 165 feet under 175 pounds pressure.

After the power test a speed test was made, Mr. Webb driving. The route was out Main street to the Almshouse, and the return trip was made through the Park to Delaware avenue, to Ferry and then in Main street. On the way out a stop was made at Engine House No. 16, and from



View showing the interior arrangement of the White combination ambulance and patrol used by the City of Trenton, N. J.

there to the Almshouse, a distance of 3 6-10 miles, was covered in 7½ minutes This was a speed of about 35 miles an hour, but it was said the machine had made the 18 per cent. grade at Ferry street at about 43 miles an hour, and that it was capable of being driven at 60 miles an hour. The apparatus is a combination, fire engine and hose-cart. It carries two ladders, 1000 feet of hose and 6 to 10 firemen. Its motor is a 6 cylinder 70 horsepower engine, and is capable of pumping 1,000 gallons of water a minute.

Similar machines are now in use in a score of smaller cities, and are manufactured complete at a cost of $7,500, which is about $1,500 less than is paid for the largest engines now in use. The demonstration was so successful that resolutions will be introduced into the Council for the immediate purchase of six of these machines.

WHITE AMBULANCE AT U. S. NAVAL HOSPITAL AT PHILADELPHIA

Among the various government stations using motor vehicles is the U. S. Naval Hospital at Philadelphia, Pa. This hospital is using a 30 H. P. stock chassis "Model K" fitted with an ambulance body built according to government specifications. The body of this car is made of aluminum and measures inside, on the floor, 6 ft. 8 in. by 42 inches, but widens out to 54 inches on a level with the seats. The body and running gear are finished in black with a red Geneva cross on each side. There is a three section door at the back, allowing the whole rear to be thrown open to facilitate the handling of patients.

Ventilation was one of the main features considered in the construction of the body of this machine. The partition between the driver's seat and the main body contains a drop window about 18 inches high, which extends the full width of the car. On each side there are two drop windows, protected on the inside by vertical brass rods. Each section of the rear door contains a drop window about 18 inches high and a foot wide. With all the windows down there is an open space 18 inches high practically all the way around the upper part of the body, assuring plenty of air. The floor, step and running boards are covered with white rubber. The body is upholstered on the inside in leather stuffed with hair. The seats, running the full length of the machine, accommodate 10 persons, or when stretchers are used, raise up. On the under side of the seats, at the proper distance apart, are hooks, so placed that when the seats are up they support the outside handles of two stretchers placed side by side. There is a strap at each end of the car hanging from the ceiling, in such a position that its lower end holds the inside handle of both stretchers. Underneath these two hanging stretchers two more can be rolled in on the floor. The driver is protected during inclement weather by front and side curtains.

This machine was purchased in August, 1908, and since then has given entire satisfaction. It has had no mechanical difficulties whatever and has had only one new tube put on. The man who formerly drove the horse-drawn ambulance operates the car and states that it is easy to control and does all that is claimed for it. The auto can make about 65 miles per hour and covers about 60 miles on 21 gallons of gasoline. The hospital authorities state that the motor ambulance displaces two of the horse-drawn variety and could do much more were it necessary.

JEFFERSON HOSPITAL (PHILA.) USES ELECTRIC

The Jefferson Hospital, Philadelphia, Pa., has had in use for the last twenty months an electric ambulance manufactured by the General Vehicle Company of New York City. This machine cost $3,000, and for the first year cost $3.00 less per month to operate than the horse-drawn ambulance it replaced. The upkeep expense for the second year, however, will be nearer the cost of the horse ambulance, owing to the fact that a new set of batteries were recently purchased. The batteries give about 40 miles on a

charge and a speed of about 16 miles per hour. The car complete weighs 3800 lbs.

The body is made of wood, and inside is 6 feet long, 40 inches wide on the floor and 46 inches wide on a level with the seats. The seats are covered with leather. Two electric lamps furnish light for the interior and the side lamps are also electric. A stationary window divides the driver's seat from the main body, and there are also two side windows near the rear. The back of the body consists of double doors extending two feet from the floor. The upper half is open and is fitted with a drop curtain for protection in bad weather.

# Hart-Kraft Commercial Power Wagons

The Hart-Kraft Motor Co., York, Pa., are placing on the market a line of 1,000-lb. delivery wagons, of gasoline type, all using the same chassis. A variety of stock bodies are carried but individual chassis will be sold separately and bodies made to suit requirements if desired by purchaser. The chassis alone sells for $1,050.00 and with open body $1,100.00 and with a complete line of regular stock closed bodies, $1,200.00.

Fig. 1. Hart Kraft Light Commercial Delivery Wagon fitted with two cylinder opposed motor with offset cylinders, motor 4½ inch bore by 4 inch stroke, water pump water cooling. This power plant is an interchangeable self-contained unit, and can be removed from the frame by taking out five bolts. This includes the planetary transmission, multiple disc clutch, differential and jack shaft. Ignition by Splitdorf magneto, which is made an integral part of the power plant. Its gears are also extended as an auxiliary. Tires 36 x 2½ inches solid. Wheels, Firestone and Swinehart Clincher, applied to rear. Carrying capacity, 1,000 lbs. Frame 10 feet long, width 3 feet, wheelbase 90 inches, bodies finished in lead ready for color and varnish. Price of chassis, $1050 f. o. b. York, Pa.

These cars are powered by a two cylinder opposed gasoline engine of 4½ inch bore by 4 inch stroke, and are rated as 14-16 H. P.

The power plant consists of the engine, magneto, change speed gear case, differential and jack shaft, and is carried on an angle iron subframe mounted on three points, one at the front and one at each end of the jack shaft, these latter being fastenings to the under side of the side frame members. The side frame members are an integral part of the body construction in the cars which have the standard bodies but for the purpose of using different bodies, the chassis is also made with separate side frame members, these in every case are of armored wood type. Of course with the mounting employed for this engine, transmission, etc., it is not necessary to remove the body, as the power plant can be dropped out by removing the nuts from the ends of the side bolts which hold the jack shaft in position. From the ends of this jack shaft, long adjustable radius rods extend to the rear axles where they are attached by a yoke end with a bolt passing through.

The cylinders of the engine are offset one inch from the center line of the crank shaft, giving the usual advantages of this construction, such as less side thrust on the piston, and this is arranged by one cylinder being offset upward and the other downward, so that this practically overcomes the friction on the cylinder walls due to the weight of the pistons in the cylinders

The pistons themselves are the usual gray iron construction, with flat heads and are built with three rings diagonally cut

# The Parr Motor Truck

A new friction driven power wagon here described and illustrated for the first time has just been placed on the market by the Parr Wagon Company with general offices in Pittsburg and factory at Huff Station, Pa.

The first machine was built for a wholesale grocery firm in Pittsburg, who probably have as extensive a territory to cover as any house of their description in that city. Their loads are heavy, their trips are long, and there are plenty of hills; the streets are badly cut up by ruts and innumerable street car crossings. The truck was made especially heavy and was designed with all these features in view, so that it would not break down under the heavy duty imposed upon it.

Fig 1. The Parr Motor Truck. This new friction driven truck is shown in use in gr[illegible]ol very service. Weight complete 6800 lbs.; special double steel friction drive, motor 4 cylinder 4½x5, cycle water cooled under the front, on pressed steel frame. Paying load capacity 3 tons.

The truck was originally designed to carry only a two-ton live load, but carried the large loads mentioned after the size of all the parts, except the transmission, was increased so that it is hardly fair to expect the transmission to do even the work that it has done. It was not intended to pull with the original transmission over about 8,000 lbs.—counting truck and load, so that when 14,000 lbs. were successfully carried with the original transmission, about 75 per cent. overload was being taken care of.

The makers feel that the service that it has been giving has been about as hard as can be demanded of any truck, and the success that it has had is very gratifying, since they understand that a number of truck manufacturers prefer to sell their products in other cities than Pittsburg, simply because of the extreme conditions of service required there. The makers also assume that if its friction transmission, which is the feature of the truck

The truck weighs complete 6,800 lbs., ready for the road, but the statement is made that it has frequently hauled over 7,000 lbs. of live load, which with the driver made the total load propelled, over 14,000 lbs.—or 7 tons. This load it is claimed has been hauled up any hill that would ordinarily be negotiated by the wagon service.

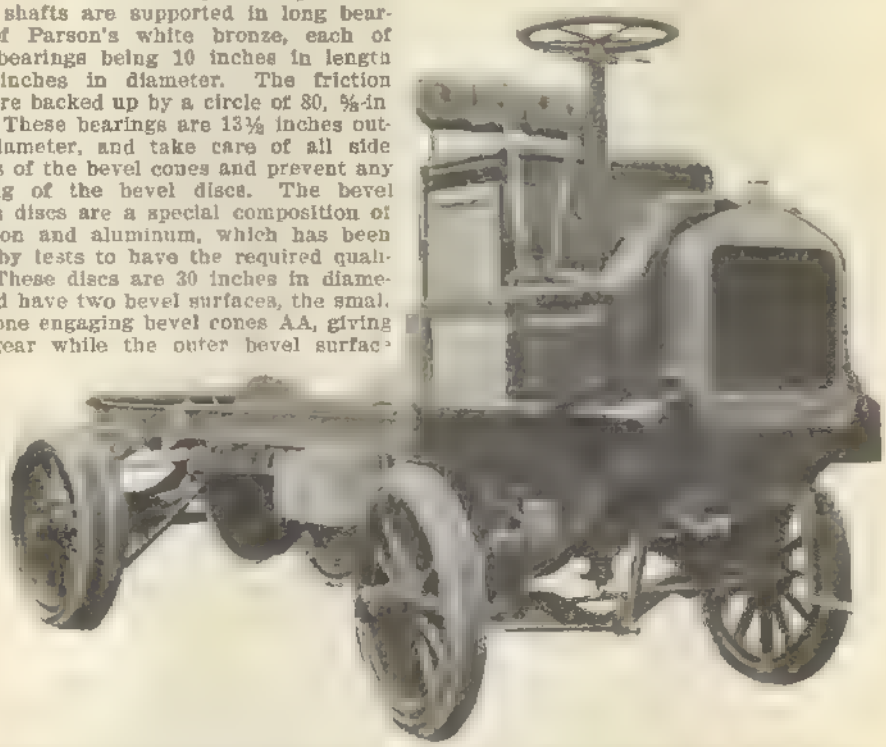
and the construction in general gives good service in Pittsburg, it ought to be able to travel among the best of them in other cities, where requirements are not so stringent.

### THE FRICTION CHANGE SPEED

The feature of the new commercial vehicle is its new patented friction drive, which at once eliminates the usual clutch, sliding or planetary gear and the differential gears.

Power is transmitted from the engine through a short shaft provided with an Oldham coupling to a set of spur ratio gears continuously in mesh and enclosed in an oil-tight aluminum housing. These gears drive two parallel shafts upon which are mounted the bevel friction cones which engage the two large bevel discs. This arrangement is clearly shown in Fig. 5, a plan view. A frame work supports the shafts, driving discs and cones, maintaining their relative positions and preventing any misalignments. This frame is supported on the main frame of the ma-

chine at points on the sides by bolts, nuts and lock washers, there being four sets of three bolts each. When these are removed the entire friction transmission assembly, can be dropped down out of the car. The outer ends of this frame which is of cast steel, suitably webbed for strength, supports the short jack shafts from the two friction bevel discs, the outer ends of which carry the sprockets. These shafts are supported in long bearings of Parson's white bronze, each of these bearings being 10 inches in length by 2 inches in diameter. The friction discs are backed up by a circle of 80, ⅝-in balls. These bearings are 13½ inches outside diameter, and take care of all side thrusts of the bevel cones and prevent any warping of the bevel discs. The bevel friction discs are a special composition of cast iron and aluminum, which has been found by tests to have the required qualities. These discs are 30 inches in diameter, and have two bevel surfaces, the small inner one engaging bevel cones AA, giving high gear while the outer bevel surface



Three quarter front view of the Part [illegible] Attention is called to the pressure [illegible] shows the bar [illegible] placed across the front just below the [illegible]

engaged by bevel cones BB, gives the low speed. Cones CC, give the reverse, this latter combination when engaged slightly compress springs DD, which gives them an instant release when the operator relieves the pressure on the reverse lever. The shafts which carry the bevel friction cones are prevented from springing by a cross strut, E, which holds them absolutely parallel by means of roller bearings at its ends. This strut makes it impossible for the bevel cones to get away from their work. The bevel cone carrying shafts are each 2 inches in diameter, and are carried in two plain bearings on the supporting housing, each of these bearings being 8 inches in length, thus giving unusual rigidity to the friction wheel mounting. Differential action is obtained by a slight slippage, in rounding a curve, between the cones and the discs. It might also be incidentally mentioned that with this type of transmission both the tires and chain are subjected to much less sudden strain and, therefore, have longer life than is the case with sliding gears when the power takes hold suddenly. The action in starting is always extremely smooth, no matter how suddenly the levers may be operated. The first contact of the friction surface is proportionally light and a slipping action takes place starting the load gradually, making the entire operation easy on all parts of the mechanism except the friction surfaces themselves and these are made to stand this kind of use. All wear comes on the soft friction cones which can be replaced by any one with only such tools as a monkey wrench and hammer, for in the neighborhood of $3.50 each. It is claimed the cones already in use for several hundred miles do not show appreciable wear. The low speed is the one that receives the greatest amount of wear, but these are guaranteed absolutely by the makers, not as is usual against defects in workmanship and material, but are guaranteed broadly against use, misuse, or abuse which at once puts at rest any question as to expense of friction surface renewal. No broader guarantee could be asked for or given. The friction cones are operated through single-tree type equalizers FF, pivoted at the center and fitted at the outer ends, where the cone hubs are gripped, with roller bearings each provided

with a special grease cup, thus insuring freedom from wear and lubrication troubles at this point. The equalizer insures equal and positive contact of each of the cones with its friction wheel. The drive from the sprockets is by 1¼-inch Diamond chain to large 54-tooth steel sprockets bolted to the brake drum, the entire assembly being bolted to the Timken hubs

are used, the wrist pins being fastened to the connecting rods by bolts, nuts and cotter pins and have their bearings in the piston bases. This gives them slight freedom for lateral motion, yet the ends of the pins cannot at any time touch the cylinder walls. The heavy drop forged crank shaft with three main bearings of Parson's white bronze is mounted in an alumi-

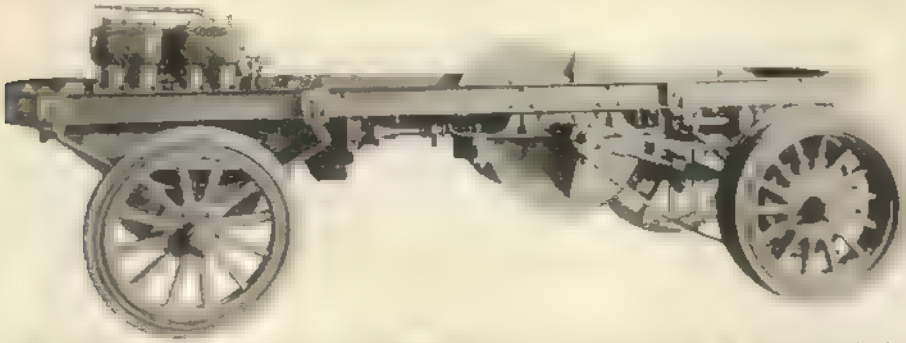


Fig. 2. Side view of the Parr motor truck. This view shows the mounting of the engine, the heavy channel steel frame and a side view of the large [illegible] gears. The entire control is by two levers and one pedal, the lever in forward position engages the high speed, in reverse position applies the service brakes on the rear wheels, the other lever in forward position [illegible] speed ahead and in reverse engages the reverse, the pedal operates the emergency rear brake. The wheels are [illegible] with 36 in. dia. solid twin tires. Semi-elliptic front springs, platform rear springs.

of the wheels. The front sprockets have 12 teeth, the speed ratio from engine to rear wheels on the low being 27 to 1, and about 13 to 1 on the high, giving the truck at 1000 R. P. M. of the engine a speed of about five miles per hour on the low and between eleven to twelve miles on the high.

num case, the bearings being supported from the upper half of the case, the lower half being simply an oil reservoir fitted with webs, preventing the oil from shifting when the machine is on a hill. A self-contained lubricating system is employed, the oil being forced by a gear pump from the lower half of the crank case which is

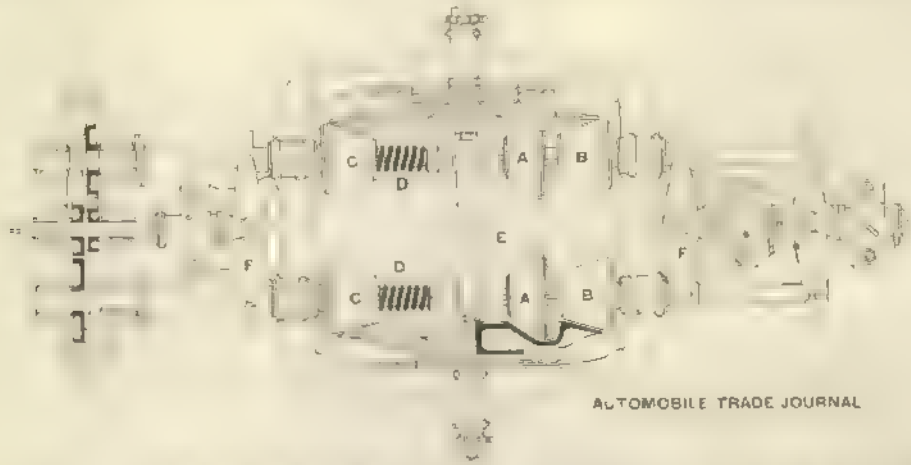



Fig. 3. Plan [illegible] Parr [illegible] double bevel friction drive. Fig. 1 [illegible] discs both alike [illegible] of cast iron and [illegible] bevel pinions AA give high gear, BB low gear [illegible] At the forward end [illegible] in a movable housing are spur gears which transmit the power from the engine to the two [illegible] shafts which carry the leather and fiber friction cones. All cones are engaged by single tree type equalizers insuring equal driving effort from all cones.

MOTOR

The motor is 4-cylinder, 4¾x5, 4-cycle, water cooled and is manufactured by the Waukesha Motor Co., Waukesha, Wisconsin. It has the usual approved 4-cycle arrangements, aluminum crank case, gray iron pistons with rings above the solid steel pin, I-section bronze connecting rods

a reservoir directly to the main bearings, the overflow maintaining the splash pool level, the splash taking care of the connecting rods, pistons and cylinder. The engine is supported at three points on the channel section pressed steel sub-frame. At the forward end of the engine case are two integral supporting arms while

the rear end of the case rests directly on a drop sub-frame member. The fly wheel is about 15 inches diameter and very heavy, giving uniform motor action at slow speeds.

A large honey comb radiator of square contour is placed at the front on the upper part of the frame and is protected by a 6-inch oak buffer which projects beyond it. This radiator is fastened at its base, the upper end being flexibly connected by short braces so that the weaving of the frame will not spring it and make it leak. The water connections to the top are by flexible rubber hose. The radiator also serves as a tank the entire system carrying about ten gallons.

ated. These brakes give a total surface in the neighborhood of 6½ sq. ft. and this does not take into consideration the fact that with this type of transmission the reverse is a very efficient brake in itself and alone is sufficient to bring the truck to a stand even on hills. If left in it will immediately start the truck backwards and this action takes place smoothly and without any jolt or jar.

THE WHEELS

The rear wheels are 36 inches in diameter fitted with twin solid tires 3½ inches in diameter, choice being given purchasers of either Firestone or Swinehart. The front wheels are 34 inches with 4-inch tires. The spokes of the rear wheel are

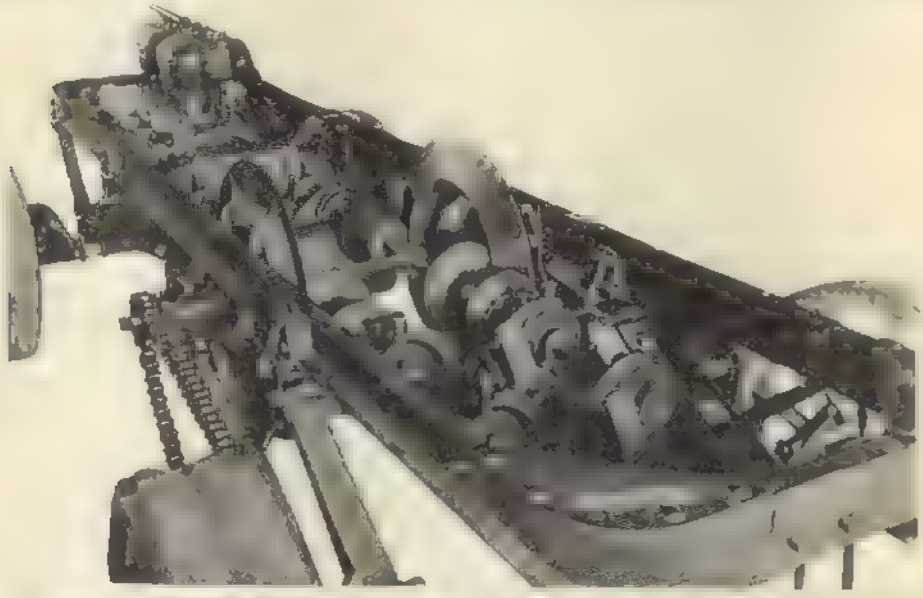


Fig. 3. Portion [illegible] This view shows the bevel friction drive and [illegible] the worm driving [illegible] of the [illegible] of the [illegible] employed.

The ignition is by jump spark plugs, being arranged from the inlet valves or top and current supplied by magneto and half starting dry cells are supplied.

The entire control is effected by two levers and one pedal. One lever in forward position operating the high speed and in reverse position controls the service brake on the rear wheels, the other lever in forward position gives low speed ahead and in reverse position gives the reverse or backward motion, in the upright position, levers are in neutral. The pedal operates the emergency brakes also on the rear wheels.

BRAKES

The braking service on this truck is extremely large, there being two independent brakes on the rear wheels, each acting on separate drums of cast iron. The inner drum is 18 inches in diameter by 4-inch face. The outer drum is 21x4½ inches, and both brakes are of expanding shoe type, Raybestos faced and cam operated. These brakes give a total surface in the neighborhood of 6½ sq. ft. and this does not take into consideration the fact that with this type of transmission the reverse is a very efficient brake in itself and alone is sufficient to bring the truck to a stand even on hills. If left in it will immediately start the truck backwards and this action takes place smoothly and without any jolt or jar.

THE WHEELS

The rear wheels are 36 inches in diameter fitted with twin solid tires 3½ inches in diameter, choice being given purchasers of either Firestone or Swinehart. The front wheels are 34 inches with 4-inch tires. The spokes of the rear wheel are 2¾ inches in diameter and of the front, 2½ inches. All four wheels are mounted on very large Timken roller bearings. The rear axle is 2¾ inches square section and the front axle a 2½-inch I-section, drop forging. The steering knuckles are also fitted with Timken roller bearings.

SPRINGS

The rear springs are of platform type, the rear cross spring having 16 leaves 2½ inches in width, ribbed. The side springs have 14 leaves and are mounted on top of the square axle in oak saddles, which are to a certain extent compressible, relieving the spring of any unnecessary strain at the point of connection. They are held to the axle by large substantial clips consisting of 4⅞-inch bolts, with heavy cross straps at top and bottom. The forward springs are semi-elliptical, 15 leaves, 2½ inches wide, 42 inches from spring eye to spring eye. These are connected to the frame at the rear by specially forged shackles and are pivoted at their forward ends

The frame is of one piece 5-inch channel section, open hearth steel and is rounded at the corners, heavily reinforced by gusset plates and hot riveted. This frame, even as heavy as it is, is said to have considerable elasticity.

STEERING GEARS.

The steering gear is of the nut and screw type, there being two nuts operating on a quadruple thread, the nuts being arranged so that they can be adjusted toward each other to take up any back lash due to wear. This can be done very readily by simply adjusting a nut at the lower end of the steering column which is accessible from the outside of the car. A 20-inch wood rimmed wheel with a five-pronged brass spider is used, this being mounted at the top of a vertical steering column which below the wheel carries the spark and throttle levers.

BODIES.

The driver's seat is arranged over the motor, giving the maximum paying load carrying capacity. The rear platform is 10 feet x 5 feet, with practically no overhang at the rear. The paying load is three tons, although, as usual with trucks a heavier load can be carried if absolutely necessary, but this is not advised. The motor is accessible from every side, and also through the floor boards and the coils, batteries, tool box and gasoline tank are under the driver's seat. The standard body is of the half panel and canvas variety as shown in the accompanying illustration, but bodies can be had at suitable prices to suit purchasers' requirements.

The makers claim that in eliminating the clutch sliding gears and differential they have removed to a large degree the trouble-breeding features of a truck. It is well known that one drawback to the general use of trucks has been that it is hard to get a set of men, sufficiently capable of operating a truck at the wage ordinarily paid the driver of a team, and although they do not mean to say that a man should not have some general knowledge of machinery to handle a truck, they do claim that aside from lubrication and a little attention to the motor, any man of ordinary intelligence can handle this truck. They guarantee that the transmission cannot be injured by any use, abuse or misuse in the ordinary sense of the words, not of course, meaning that the truck cannot be ruined by an accident or collision, or throwing over an embankment, but that a driver cannot by any careless handling of his levers break the transmission or put it out of commission.

## COMMERCIAL NOTES

The Charles Seibold Livery Company, of Alton, Mo., has purchased several autos which are to be hired out by the hour or day.

A 12-passenger rapid bus has been delivered to George Beezer, of Bellefonte, Pa., for use between that point and Penns Cave.

A motor bus service has been started by Walter Shelby, running between Defiance, O., and Paulding. A 15-passenger car is being used.

A company, capitalized at $10,000, has been incorporated at Dillon, Mont., to operate a summer auto service between Armstead and Grant, on Horse Prairie, Mont.

A Waverly electric delivery wagon was recently placed in service by the Dor Smith Company, ice cream manufacturers of Eau Claire, Wis.

The municipality of Fort Worth, Texas, has purchased a Buick car for the use of the water works department. Motorcycles for the police and auto fire engines are contemplated.

A 60 H. P. auto recently supplanted the horse drawn stage operated between Fossil and Condon, Ore. The new machine has accommodations for 10 passengers and 3,000 lbs of freight.

An auto bus line is to be operated in Johnstown by the Southmont Transit Co., and four Rapid cars have been ordered.

The Interstate Auto Touring Company, of Indiana, has placed in touring service a "Seeing Indianapolis" car, which takes trips in and around the city. The car is stationed at Washington and Meridian streets. A fare of 50 cents is charged for a 15-mile ride.

The Nashville Taxicab Company, of Nashville, Tenn., was recently incorporated with a capital of $30,000.

The New York Butchers' Dressed Beef Company is using a 3-ton Frontenac motor truck for delivery purposes.

It is planned to establish a motor stage line between Rome and Adairsville, Ga., a distance of 18 miles. Two round trips a day will be made.

The authorities of San Diego, Cal., have purchased an auto for the use of the councilmanic inspections and departmental business.

A motor stage line is being operated by a Mr McCulley between Shaniko and Bend, via Prineville, Ore. A 60 H. P. car is being used.

In Worcester, Mass., two motor hearses have been placed in service by Alfred Roy & Sons, undertakers.

Suggestions for improvements in commercial motor trucks will be included in the August "1910 improvement number."

The Federal Motor Car Co., of Rockford, Ill., has moved to Elkhart, Ind., where it is installed in a new factory building. High wheel motor vehicles and light delivery cars are being produced there.

A waste product of paper mills, called "spruce turpentine," is being experimented with by the engineering laboratory of the University of Wisconsin, Madison, Wis., to determine whether or not it can be used for denaturing alcohol as a fuel for internal combustion engines.

The "Chicago American" is getting very remarkable service from three Randolph trucks, which they use in distributing their papers from the downtown printing establishment to the various dealers in the outlying districts. Each of these three cars travels between eighty and one hundred miles each day, six days in the week, between the hours of 1 P. M. and 8 P. M.

# The H. H. Babcock Gasoline Cars

The H. H. Babcock Co., of Watertown, N. Y., are placing on the market for the coming season a line of solid tire automobiles fitted with the well known Davis 2-cylinder opposed motor manufactured by the Davis Manufacturing Co., of Milwaukee, Wis. This motor is water-cooled, has a bore of 5 ins. and a stroke of 4 ins. The crank shaft is 1¾ and 2⅜ dia., connecting rod big ends are fitted with bronze babbit lined boxes. All parts are interchangeable, valves are 2⅛ in dia. and mechanically operated, thermo-siphon cooling is employed, the radiator is of the vertical tube type manufactured by the Rome Turney Co., Rome, N. Y., the entire system having a capacity of about 3½ gallons. This amount of water, it is claimed, is sufficient so that no fan whatever is necessary.

The Babcock gasoline machine is not to be classed with motor buggies but is, in all respect, an automobile, although fitted with 36-in. wheels carrying solid rubber tires. The first car, it is claimed, has been thoroughly tested during the past winter, running through snow, ice and mud, upwards of 5,000 miles.

Realizing the necessity for special springs, in connection with the use of solid tires, a special study of the springs was made, the present springs being the result, and the claim is made that these springs are entirely satisfactory. Vibration is further reduced by the use of a laminated ash frame. This frame is of unusual construction, consisting of two sections united at the center with a special saw-tooth like joint which gives unusually large glueing surface and produces a frame of great strength. The section of these frames is 4⅛ in depth by 1 9-16 in width. By running the grain of the sections in opposite directions, the strength of the frame is very much increased and the shock absorbing qualities of the wood frame in addition to the special springs, make the use of solid tires practical.

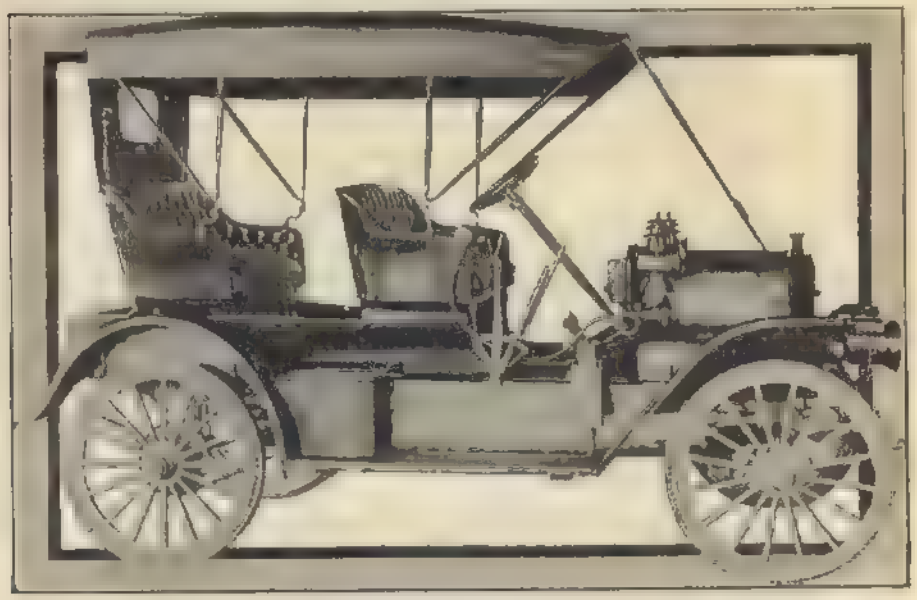


Fig. 1. H. H. Babcock Utility vehicle with convertible body, the rear seat being removable and forming a farm wagon [illegible] solid tire automobile [illegible] inch wheels and Motz Anti Skid tires. It is designed especially for the use of solid tires, having special springs and reinforced wood frame; the construction follows automobile lines [illegible] under the hood [illegible] by 4 inch thermo siphon water cooled Rele[illegible] sliding change speed gear mounted on Brass[illegible] suspension, max[illegible] speed 35 miles per hour. Ten gallon pressed steel [illegible] Wheel base [illegible] inches, gauge 56 or 61 to a special order. Equipment — [illegible] with generator, full set of tools and top. Price $1[illegible]

The loosening of all nuts and bolts has been anticipated by equipping the machine throughout, with spring-lock washers and similar lock washers so that no trouble is had from this source.

In Fig. 1 is shown a view of the complete car fitted with surrey seat and top. The adherence to regulation automobile design will be noted, also the fact that the entire underside of the car is protected by a pan and splash aprons are provided between the running boards, mud guards and the body.

The first models were equipped with two speed planetary transmissions, but

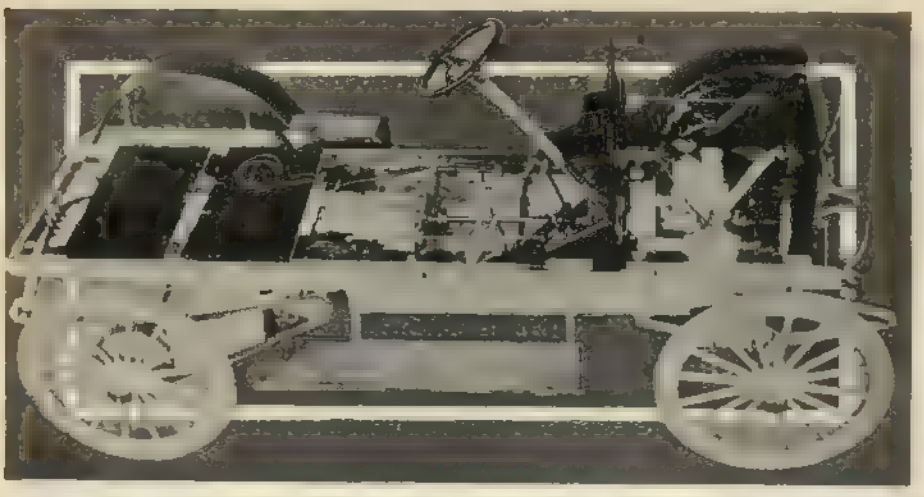


Fig. 1. View of H. H. [illegible] 2 cylinder Is H. H. [illegible] gear transmission [illegible] Hele Shaw multi[illegible] with solid rubber tires [illegible] wood frame details of special nature in ex[illegible]

this form of transmission was soon discarded in favor of a regular three speed and reverse sliding gear this, however, necessitating the use of a clutch the company decided on the well known Hele-Shaw multiple disc clutch rather than experiment with unknown forms. With this clutch it is claimed to be entirely practicable to start the car on slight grades and rough roads on high speed without any jolt or any undue strain on the mechanism. The features and advantages of this clutch are so well known as to need no special description here.

In Fig. 2 is shown a side and partial plan view of the chassis and in Fig 3 is clearly shown the arrangement of the parts by a plan drawing. The motor is mounted crosswise under the hood at the front directly on the main frame by means of two integral lugs on each of the cylinder heads. The drive is from the Hele-Shaw clutch to the line shaft connecting with the transmission case through which a 1¾ in. jack shaft mounted on 1¾ by 4½ bearings passes. From the jack shaft the drive is to the rear wheels through roller chains.

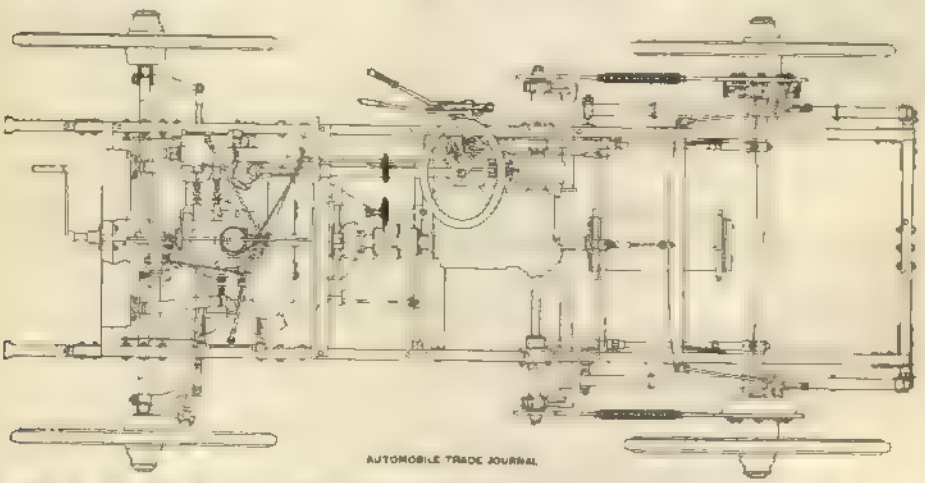



Fig. 3. Plan view of H. H. [illegible] Car showing [illegible] of the engine in the frame [illegible] means of [illegible] a large muffler at the [illegible] the [illegible] frame. The [illegible] connected with [illegible] Hele-Shaw [illegible] is placed between the engine and [illegible] and the transmission [illegible] of a three point suspension the rear end being supported by a [illegible] the jack shaft [illegible] the out-board ball bearings of the jack shaft. The steering gear is [illegible] sector and [illegible] is placed in a protected position behind the [illegible] brakes are provided, one brake being on the [illegible] wheels. Brakes against steel drum operated by full [illegible] weight of complete car with top, both tanks full and complet[illegible] the rear axle and 2 [illegible] lbs. for the two seated car

THE TRANSMISSION

The change speed mechanism is built specially for this company by the Brown-Lipe Gear Co., Syracuse, N. Y. This transmission is mounted throughout on annular ball bearings. To secure rigidity transmission and jack shaft are mounted on seamless steel tubing, the outer ends of which support the out-board bearings of the jack shaft, thus bringing the bearings very close to the sprockets. The change speed gear case itself is carried on a large pad which is riveted to the cross housing also acting as a brake drum for the foot brake, which is a double acting Raymond, controlled by the right pedal. The emergency brakes are of the expanding shoe type, acting on each of the rear wheels on pressed steel brake drums 10 ins. in dia. These drums, together with the sprockets, are bolted to a flange which is an integral part of the hub casting, the brakes used have 1½ in face and are cam operated, the wearing surfaces being thermoid brake lining and the pressed steel drums

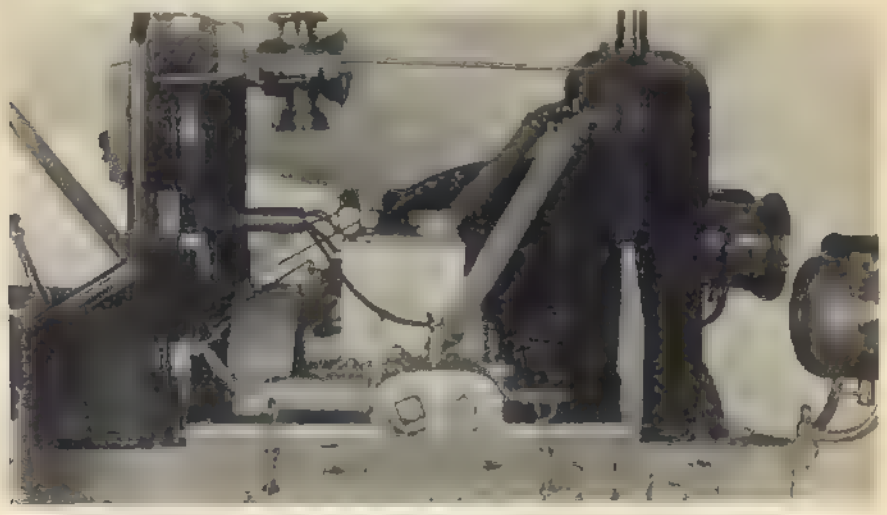


Fig. 1. View of the [illegible] S. H. P. engine in the frame of the I. H. Babcock Gasoline car. It shows the position of the motor in the special rubber connections with rubber covered ends to the radiator, the pressed fibre valve [illegible] for dry grinding of the valves. The simple wiring all wires passing through an insulating tube is also shown as well as the force feed oiler on top of the crank case.

piece and bolted to the transmission case. The front end of the case is supported at a point on a cross bar of the frame, thus providing a three point suspension. A universal joint is placed between the engine and the transmission and consists of a squared end dumb-bell shaped piece, fitting into square sockets in pieces on the clutch and transmission shafts. This is sufficient to take care of springing of the frame and prevents binding of the shaft

IGNITION

Ignition is by jump spark from two sets of dry cells and a Connecticut two unit oil. The dry cells are carried in a box built in the front end of the compartment on the runabout and under the front seat on the two seated rig. This compartment or box for the cells is so arranged that 12 cells are placed crosswise of the car so that the carrying space is only shortened 3 inches by the battery box, all wires are carried through insulating tubing to the motor, thus doing away with chances for short circuit

In the plan view it will be seen that the differential housing is carried on the jack-shaft outside of the transmission case, this

A special gear shifting lever is used and on account of the ease with which the car starts on the second speed it is usually started that way and neutral position has been placed between the second and the high speed. In starting the car the lever is drawn backward from neutral position until it strikes a notch provided on the gear shift quadrant. To do this it is not necessary to release any pawl by thumb action, as the neutral notch is very shallow. The high speed is then obtained by throwing the lever forward, the pawl passing over the neutral notch without trouble. No notch is provided for high speed or reverse position as they are both at the extreme limits of motion of the hand lever and are self locking by means of a poppet spring and rack which holds the gears in all positions irrespective of the sector. If in climbing hills it is necessary to come back to second speed all that is necessary is to release the clutch and draw the handle back until it strikes the stop, without releasing the thumb button, making an extremely simple gear shift control, this much being similar in action to a selective control In order, however, to pass into the low

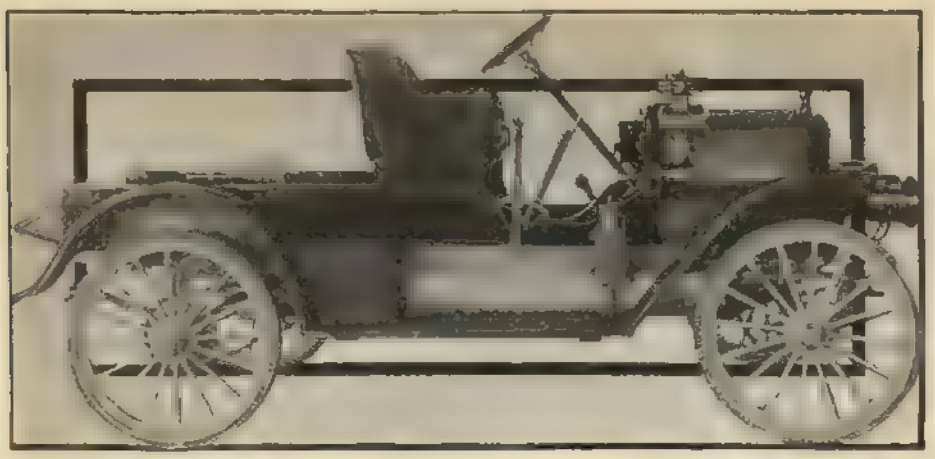


Fig. 5. View of the H. H. Babcock car with rear seats removed forming a Farmer's Utility wagon. Forward springs full elliptic, rear springs half platform, wheel base 96 inches, tread 56 or 61 inches, order wheels 36 inches with solid tires, jump spark ignition, three speed and reverse sliding gear transmission, H. Brow clutch, side chain drive, ball bearings throughout.

speed it is necessary to release the thumb button, pushing the lever back until the next notch is engaged. Releasing the button and pulling the lever back until it stops against the end of the quadrant gives the reverse. Spark and throttle levers are carried underneath the steering wheel and are connected by arms and ball and socket links to the carburetor which is a 1¼ inch Schebler and to the timer. These ball and socket joints are adjustable, doing away with any lost motion in the control linkage.

The steering gear is of the internal worm and sector type, irreversible and adjustable for wear. The post is set at considerable angle and enters the dash just above the floor line, leaving a clear floor space and ample foot room.

A positively driven oiler is mounted on top of the crank case and is an integral part of the motor. This oiler is driven from the cam shaft. Four feeds are provided, one to each cylinder and one to the front and one to the rear bearing.

All water connections as shown in Fig. 4 are made of special rubber made to order, the ends being rubber capped, thus preventing oil and grease from working in between the layers of canvas and rubber and rotting the same. When removing the motor or radiator it is not necessary to draw the hose off of the nipple attaching it to the radiator, as a flange is provided and securely bolted on, thus saving the hose when the motor or radiator has to be removed. The radiator is carried on a cross bar in front of the frame.

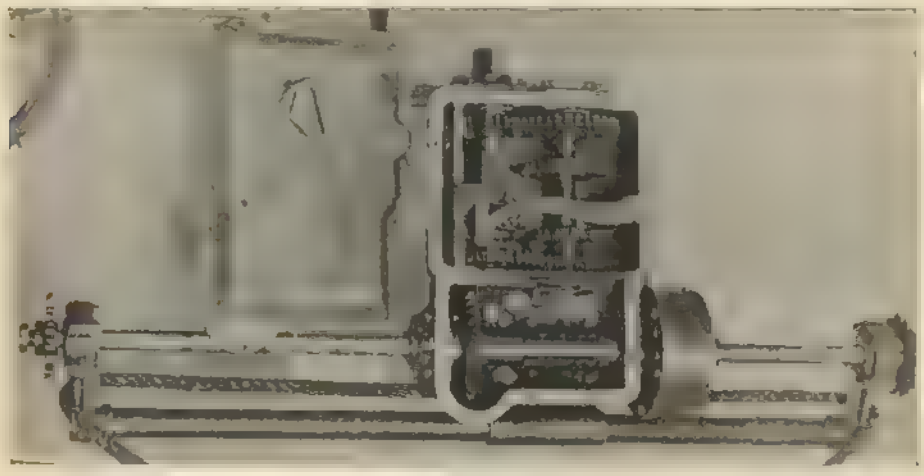


Fig. 6. Transmission and jack shaft of the H. H. Babcock car. This view shows the transmission with cover removed. The rear end is supported on the seamless steel tubing shown. The differential is on the jack shaft outside of the case, its drum acting as a brake drum. This transmission is mounted throughout on Hess-Bright ball bearings.

and no part is attached to the side members, thus doing away with any leaks caused by twisting of the frame.

The plan view of the chassis shows the method of bracing the corners of the frame, both inside and outside irons being used. The corner iron is a malleable casting provided with a one inch rib extending the full length of the inside face, the frame being mortised to receive this rib thus giving it additional stiffness. The outside iron is band steel bent to shape and held to the inside iron by through bolts. All cross members of the frame are mortised into side members and are

springs shifting or getting out of alignment, special precautions were taken in clipping the spring to the axle and also to the frame. Four spring clips are used at the top and at the bottom, spaced well apart so that the spring has a secure fastening. Each half of these springs has four leaves, each 1⅞ inches in width. The rear springs are of the semi-platform type, six leaves. The side members are 42 inches long and the rear cross member is 35½ inches and is placed directly under the rear cross member. The strongest claims are made for the easy riding qualities of this spring suspension.

Fig. 7. View of the full elliptic front springs of the H. H. Babcock solid tire automobile. These springs are specially designed for use with solid tires. They are 37 inches long, four leaves at top and bottom, 1¾ inch wide clipped. Attention is called to the method of fastening these springs to the frame and axle, four clips being used at each place to insure a permanent connection and no chance of working loose or getting out of alignment.

also reinforced by steel plates which bolt through the side members thus holding them securely together.

TIE RADIUS RODS

Radius rod details are plainly shown in the plan view. These are placed just inside of the frame, the front rod end terminates in a large eye which is free to revolve around the brackets which support the jack shaft. The rear end encircles the rear axle to which it is rigidly clamped, thus the rod pivots on the center of the jack shaft on the same axis as the chain and is a true radius rod, keeping the rear axle always at the same distance from the forward sprockets. These rods are threaded right and left and made from a piece of hexagon steel with a lock nut at either end; by this construction adjustment is very simple as the rods can be gripped at any point with an ordinary monkey wrench, it not being necessary to mar them by using pipe wrenches.

SPRING SUSPENSION.

The front springs are shown in Fig. 7 as well as the end of the axle, steering pivot and stub axle. These springs are full elliptic 37 inches center to center and lipped. To prevent any chance of the

Realizing that the axles would have to bear the brunt of the extra shock caused by the use of solid tires, the company has designed these extra heavy. They are solid steel forgings 1½ inches high by 1⅜ wide, the bearings of the spindles being 1⅜ under the cone. The front wheels are mounted on ball bearings, the inside circle of balls being ⅝ inch dia. and the outside 7-16, a size often used on 7-passenger touring cars, a fact which is mentioned to show that bearings of ample size are being used.

On the Runabout two inch side wire tires are used, but the two seated cars are equipped with 3½-inch Motz Anti-Skid tires. These solid tire automobiles are built as Runabouts or touring cars with practically the same specifications. The price of the touring car or two seated rig is $1,250, fully equipped, including the top.

This two seated car is designed for a general utility vehicle rather than as a touring car, the back seat being entirely removable, thus converting the car into a wagon as shown in Fig. 5, suitable for farm use, hunting or fishing trips, etc.

A feature of merit is the providing the pedals with an adjustment for height, so

that they can be arranged to accommodate different drivers' requirements. The pedal pads are also pivoted. Special attention has been given to the muffler and to the pipe connections so that there will be no sharp turns and the engine will have a perfectly free exhaust. No muffler cutout is fitted but the model cars were equipped with cutouts in order to compare various mufflers and exhaust piping and it is claimed that with the muffler and piping now used, no difference can be noticed in the running of the car when the muffler is open, showing that there is practically no back pressure on the motor.

A special point emphasized by the makers is the fact that this car is not a high wheeled auto buggy but is simply a solid tired automobile, as a study of the layout of the mechanism will show. The wheels are but 36 inches in dia. and the whole car has been designed from the beginning with one end in view, to make a practicable automobile which would stand the extra shock of using solid tires and give good service on the road.

# The New 4-Cylinder $850 Maxwell

The Maxwell-Briscoe Motor Company, Tarrytown, N. Y., has just made public the specifications of a new four-cylinder, 22 H. P. runabout to be known as Model Q-2, to sell at less than $1 000.

A special feature of this new runabout is that it is equipped with a sliding-gear transmission giving three speeds forward and one reverse. This type of transmission, while used almost exclusively on large cars, has been considered heretofore too expensive to put on an automobile selling for less than $1,000, and runabouts selling at approximately this price have usually been fitted with planetary transmissions

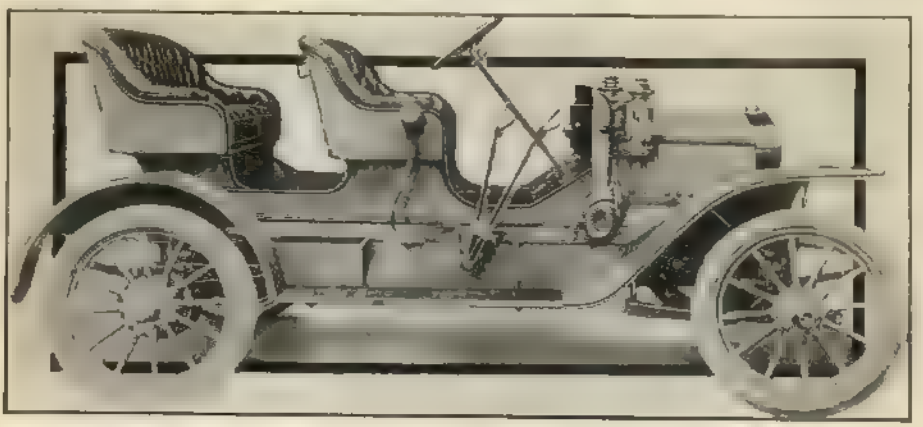


Fig. 1. The new 4-cylinder Maxwell fitted with rear [illegible] has a 4-cylinder motor of 3¾ by 4 developing 22 H. P at [illegible] gear transmission. With rear seat for one, $875. Wheel [illegible] is [illegible] Maxwell

This new Maxwell will be equipped with a magneto, a set of dry cells also being provided for emergency use. The car is put out in three styles of body, namely, the standard runabout type, having individual front seats with tool and carrying box in rear; with a rear seat for one; and with a rear seat for two.

THE NEW MOTOR

The motor is of the four-cylinder vertical type, dimensions being 3¾ x 4 inches. The cylinders are cast in pairs, the motor developing 22 actual horsepower at normal speed of 900 R. P. M. The water jackets are cast integral with the cylinders; and the valves, located on opposite sides, are interchangeable and exceptionally large. Both inlet and exhaust valves are mechanically operated. The tappet rods are of special steel, hardened and ground. The guides are of phosphor bronze. The cams are hardened and ground and enclosed within the crank case, being thus fully protected and lubricated by splash. Three large bearings are provided for the cam shafts, the shaft itself being hardened and ground. The crank shaft is of a special steel drop forging and finished by grinding. The connecting rods are of steel drop forgings, the bearings are a special grade of compressed babbit. Throughout the entire motor simplicity and strength are the dominant features

The means of access to the connecting rods is provided on each side of the crank case by plates which are quickly removable, thus exposing the rods for inspection or adjustment.

The Maxwell principles of three-point suspension and unit construction which

The new autocar for 1910, manufactured by the Autocar Co., of Ardmore, Pa., is a serviceable, popular-priced, 4-cylinder machine, fitted with either runabout or touring car body for four or an enclosed body of coupe type, suitable for doctors, all control being on the inside. These latter bodies are furnished at special prices, according to finish and equipment. This high-grade machine is placed on the market at the moderate figure of $1750.

The general features are 25.6 H. P. motor, following previous autocar designs, sliding gear transmission, semi floating rear axle, armored wood frame, Bosch dual system of ignition providing a means for starting on the spark, 34-inch wheels, five lamps, generator, horn and tools. These machines are made almost entirely in the company's plant and are in no wise assembled. The new model is shown as a touring car in Fig. 1 and as a runabout in Fig. 2. The touring body is arranged to seat four people and the runabout, three. The bodies are built of sheet metal in a standard finish of maroon, striped with black. A choice of either plain or tufted upholstery is given. Goodyear quick detachable rims are used and a choice of any of the standard tires is given.

TYPE XX MOTOR.

In Fig. 3 is shown the exhaust side of the Type XX motor, and in Fig. 4 are shown the front and inlet sides. This motor is 4x4½ inches and rated at 25.6 H. P. by the A. L. A. M. formula, cylinders are cast separately with integral water jackets and the valve chambers on one side, a single cam shaft being used. Following previous autocar practice the inlet valves are in the cylinder heads, their

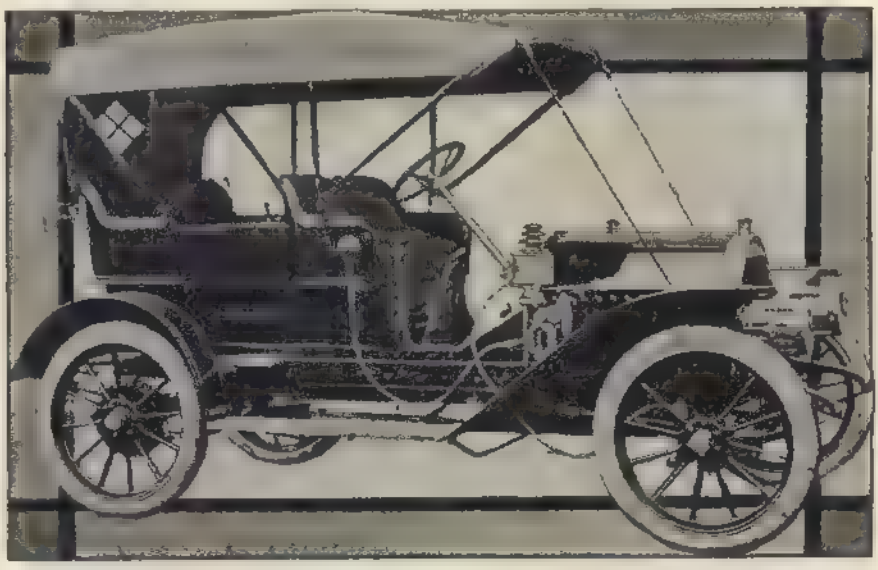
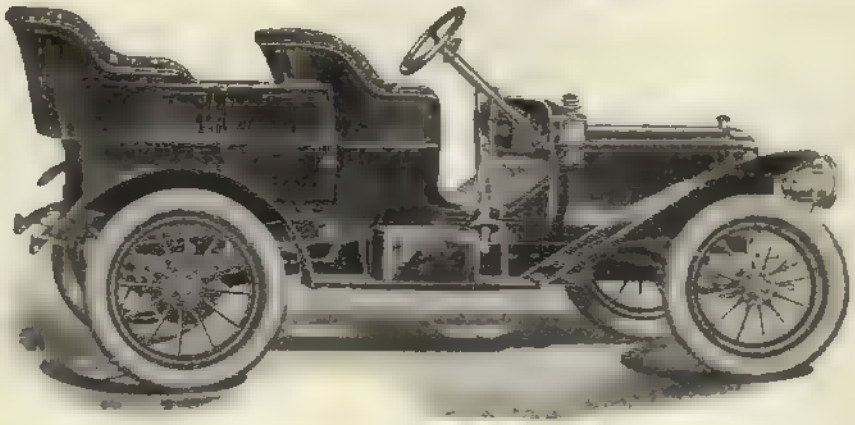


Fig. 1. Autocar Type XX with touring body and top. This new model is a comparatively light weight machine with a 4-cylinder motor 4x4½ inches developing 25.6 H. P. with sliding gear transmission, semi-floating rear axle, Bosch dual ignition system and sells for $1750. The same chassis is also fitted with an inside driven coupe body which is removable this car being shown in the headpiece of this article. This vehicle is recommended for doctor's use and has a very large carrying space in the rear.

# $300 EXTRAS--Magneto, Oversize Tires, etc., Go with this Car!



## Mitchell *Model 30*, Complete, $1500

When you see an automobile advertised at $1500 **get an itemized statement.**

See just what the price means.

If there are so many "extras" that you have to pay $1800 to $2000 to **complete** your machine it is not a $1500 car.

We welcome a demand for an itemized statement of the Mitchell values at $1500—**because it includes more than any other $1500 car on the market.**

Take the Mitchell's double ignition, for instance.

Two complete systems of ignition, using a high-grade Magneto, or batteries.

In some other low-priced cars even the cheapest Magneto is listed as an extra.

As Magneto ignition is coming into universal favor, and every motorist wants it in his car, this Magneto "extra," means $1650 for the $1500 car.

**REMEMBER**, the Magneto goes with the Mitchell Model 30, and is included in the $1500.

Then, there are the Mitchell's 32-inch wheels and 4-inch tires

Four inch tires are the large size made especially to take care of all the overload possible to a car of ordinary size

On other $1500 cars and on many that cost twice $1500, you get only 3½-inch tires.

In fact, the Mitchell has, in all, more than $300 worth of necessary equipment which, with any other $1500 car, you would have to buy. And it is built for economy all the way through

Nickel alloy and vanadium steels are used in the crankshaft, transmission and rear axle shaft—in all the driving mechanism. We have never known a Mitchell crankshaft to break.

The springs are vanadium steel. Aluminum castings are used wherever possible, strengthened with bronze wherever there is any strain.

The transmission is of selective sliding gear type, the kind used on all the high-priced cars.

The Mitchell Model 30 seats five, is commodious, comfortable and is a beauty. The wheel base is 105 inches.

The body is wholly of metal. The tonneau is detachable—and choice is given of touring body, surrey body, rumble seat roadster or runabout deck, at $1500.

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Standard Manufacturers, A. M. C. M. A.
510 Mitchell St., Racine, Wis., U. S. A.

You may send me a detailed description of your new $1500 car MITCHELL "30."

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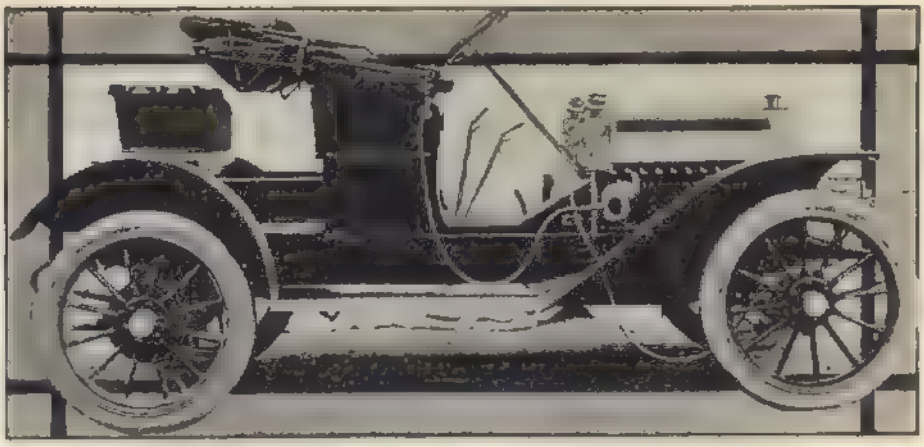

Fig. 2. A four Type XX Runabout. Same general specifications as given in Fig. 1. Price for this type of body is the same, $175. Various rear seat combinations can be had at suitable prices.

cages being held in place by yokes on two studs from each cylinder head. The valve seat is a separate ring or spider of gray iron in which a hole acts as a guide for the valve stem, this spider is held in position by the housing which is clamped on top of it. These inlet valves are operated by vertical adjustable length push rods, sliding in drilled lugs which act as guides on the side of the cylinder. The upper ends of the rods operate rocking levers, which consist of a short shaft with a small arm at each end, one arm impinging the top of the inlet valve stem and the other the end of the push rod. The short shaft is placed lengthwise of the engine, and is enclosed by and has its bearing in a housing which is an integral part of the valve cage. The actual bearing surface is in a sleeve bushing of cold rolled steel and lubrication is provided for these rocker shafts by special oil cups. The adjustment of the rods is provided by a hardened steel nut at the top and a hardened lock nut beneath it. The inertia of the valve lifting rods is taken care of by light-weight springs on the rods themselves, thus relieving the valve springs of any duty in this connection. Exhaust valves are arranged in the usual manner in the valve chambers and closed by the usual coil springs. These valves are of liberal size and are built up with cast iron heads, screwed, riveted and brazed to steel stems. The valve lifting rod guides are of bronze, adjacent ones being held by yokes from a single stud between them. The rods are fitted with hardened steel rollers operating on a single cam shaft; they are prevented from turning by

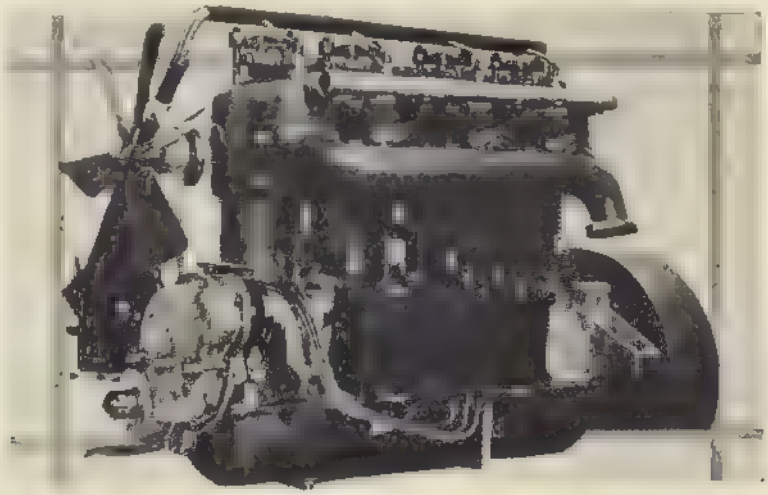

Fig. 3. Exhaust side of 1910 Type XX 4-cylinder engine, cylinders cast separately with inlet valves L, the head at top containing exhaust valves in integral chambers on the sides, a single cam shaft being used; bore 4 inches, stroke 4½ inches, 25.6 H. P. This view shows the McCord lubricator with oil pipe leads to the engine, the forward gears entirely encased and running in oil and a one-piece exhaust manifold. The flywheel is fitted with a reference pointer and the valve opening and closing positions are stamped into the flywheel rim to facilitate and make certain of proper valve timing.

sliding between flat surfaces, milled on the lower end of the guides. The cylinders are held in position by four hex studded cap screws with spring washers under each.

The cam shaft is of steel with cams of hardened steel keyed and pinned in position; this runs in two main sleeve bearings one at each end, these bearings beings held in position by cap screws into the case through the flanged bearing ends. At the center the cam shaft is supported by two half bearings each of which are placed on the under side of the shaft so as to take the thrust of the push rods.

FORCE FEED LUBRICATION.

The motor is lubricated by a McCord instrument driven by a short shaft from bevel gears on the cam shaft, three leads carry oil to the crank case, the main bearings being provided with pockets over them and the surplus oil flowing into the crank case splash pool. The crank case is divided by a special partition at the middle and the oil level can be ascertained by means of suitable length stand pipes in the case, the lower ends being fitted on the outside of the case with test cocks. A drain plug is provided at the bottom of each crank case compartment,

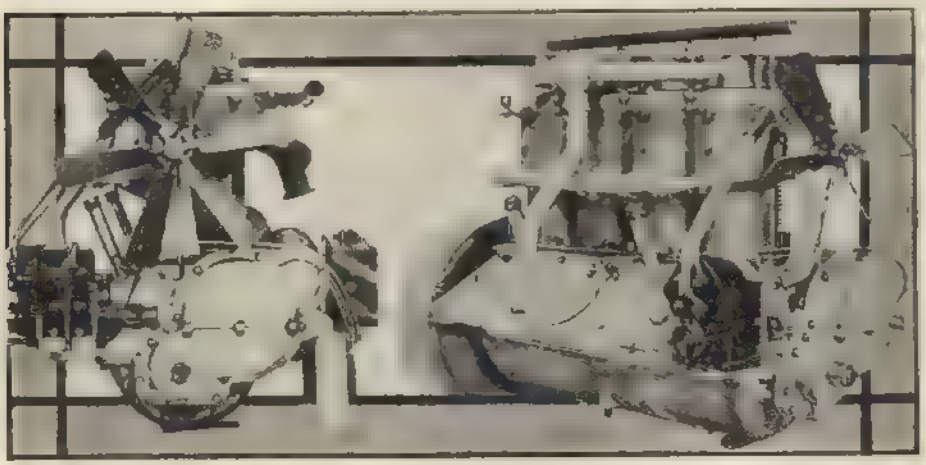

Fig. 4. Front and inlet side of Type XX Autocar engine. This view shows the mounting and wiring from the Bosch high tension magneto, the Bosch dual system being used. It also shows the fan and its mountings, and the arrangement of the crank case cover plate, breathing tubes, supporting arms, etc.

The crank shaft is 1⅝ diameter, 45½ point drop-forged steel and is mounted in three main bearings of split type of plastic bronze, bolted to the upper half of the crank case. The two end pistons and the two middle pistons move together and the firing is in the order 1, 2, 4, 3, from front to rear. The rear of the crank shaft supports a 16-inch diameter, 72-pound fly wheel, bolted to an integral crank flange shaft.

The crank case is of aluminum, the upper half having four integral channel section main supporting arms and at the center on either side a smaller single-web supporting arm, all of which rests directly on the channel section pressed steel sub frame. The gears at the forward end of the engine are encased in an aluminum housing. The crank shaft gear is of steel, cam shaft gear of fibre and bronze and the gear on the pump shaft of steel. Just to the rear of the camshaft gear is a bevel gear which meshes with a small bevel gear on a cross shaft, which runs to the right side of the engine and drives the Bosch high tension magneto, yoke and bolt retained to an integral cast bracket on the case, an Oldham coupling being interposed in the drive.

two large breathing or filling tubes with wire mesh protected ends protrude on the right side of the case from the two large cover plates, each of which are held by six cap screws. Compression relief and drain cocks are fitted at the upper end of each cylinder on the side.

BOSCH DUAL IGNITION SYSTEM.

Ignition is by jump spark using the new Bosch dual ignition system which combines magneto and battery ignition systems dispensing with much of the usual wiring and using but a single set of plugs. A high tension magneto is mounted to the right of the engine and on the dash is a single coil in a cylindrical case. The wiring is so arranged that the contact breaker and the distributor of the magneto can be used with the batteries, by simply throwing the switch on the coil. This switch is unique as it is an integral part of the coil and moves the entire coil itself which is wound very much like a high tension magneto armature. The coil is fitted at the top with a vibrator, which, however, is not in use while running but is simply brought into action by means of pushing a button at the top for the purpose of starting, this gives several sparks

and makes the chance of starting on compression more likely. As soon as the motor is working the trembler goes out of action so there is no "lag" and the ignition timing is the same for all cylinders. By arranging the coil body and a switch plate at the bottom as a unit and swinging the whole by means of a button on the side all internal connections and joints of wires are avoided and the parts may be soldered and made permanent. The vari-

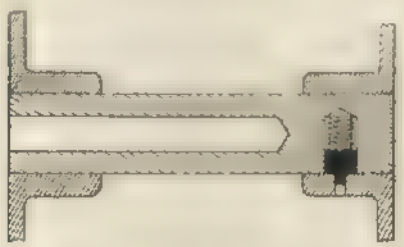

Fig. 5. Sketch of the patented A Iocar method of preventing the wrist pin from sliding out. The pin is drilled from one side, but not quite through, and tapped to receive a small plug shown below. Back the coil spring keeps the reduced end of the plug forced into the hole in the piston boss and effectually prevents the pin from moving, yet by pressing the plug inward the pin can be instantly driven out if desired.

ous contacts are effected when swing this interior portion of the coil by the switch button, by means of spring contacts set into an insulating piece at the bottom and upon which the lower portion or switch plate rests. This entire coil arrangement is metallic, there being no wood in the construction, and by unscrewing the cap at the top the entire coil can be lifted out and replaced without disturbing any of the contacts or necessitating the connecting or disconnecting of any parts, there being no external connections between the switch and coil all being taken care of by the plate at the bottom on the inside.

COOLING SYSTEM

Cooling for the motor cylinders is effected by a centrifugal bronze pump driven by a longitudinal shaft from the gears at the front, with a flexible coupling interposed in the shaft. The pump bearings, after much experiment in an endeavor to provide a suitably lubricated bearing are of Arguto wood, a specially prepared hard wood which is impregnated with oil. It is claimed this wood gives a bearing of long life and one that is always properly lubricated owing to the oil in the wood. The water is forced to the right side of the engine into a longitudinal pipe as shown in Fig. 4, from which it passes into the lower part of each of the cylinders and passes out of the top on the exhaust side to a vertical fin-tube radiator. The six-bladed fan is mounted on an eccentric bronze bushed bearing, mounted on a cast standard cap screwed to the engine case, the eccentric mounting of the bearing giving an adjustment for the V-driving belt.

The inlet manifold is an aluminum casting with a ball at the center as shown in Fig. 4, and connects with a Stromburg carburetor. The exhaust manifold is a one-piece casting of large diameter, capscrewed to the engine cylinders and is connected to an ejector muffler located lengthwise under the body at the rear.

CLUTCH AND CHANGE SPEED GEAR

The clutch is of the three-ring type, two rings being cast iron and one bronze, the latter being fitted with cork inserts. The rings are forced together by the action of a large coil spring shown in Fig. 7, which acts on a transverse shaft which controls the usual yoke and trunnion ring, this in turn operates four toggle joint arms the ends of which are fitted with adjusting set screws and lock nuts. A peculiarity of this arrangement is the use of an adjustable stop against which the arm actuated by the spring abuts the instant the rings are fully engaged, thus relieving the plates and the shaft from the spring thrust. It will be noticed that this spring contrary to usual practice is not around the clutch shaft but is at one side and under tension and not compression. The bronze ring is driven by lugs on the inside of the fly wheel rim which fit between lugs on the periphery of the ring. To prevent rattling, one of each of the sets of lugs is bored out and fitted with a small coiled spring, against which the fly

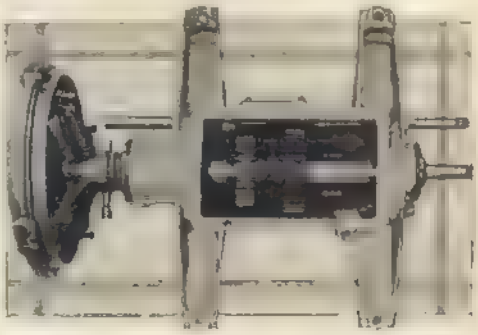

Fig. 6. View of the Autocar Type XX, change speed mechanism and three ring clutch. As shown the fly shaft is below the transmission shaft and the sliding gears operate on the splined live shaft all are mounted on Timken roller bearings and the high speed is by a jaw clutch. Gear changing is accomplished by a single lever at the side. The internal sliding gears of the transmission gears are properly heat treated and oil toughened. The clutch is operated by a spider with four toggle arms; two of the rings are of cast iron gripping between them a bronze ring fitted with cork inserts, set screws with lock nut are supplied at the end of the toggle arms and give a means of accurate adjustment.

wheel lug presses. This clutch is of the same general type as has been successfully used for several years in autocar models.

The change speed gears are of high-grade steel heat treated and oil toughened and mounted on Timken roller bearings in an aluminum case the entire top

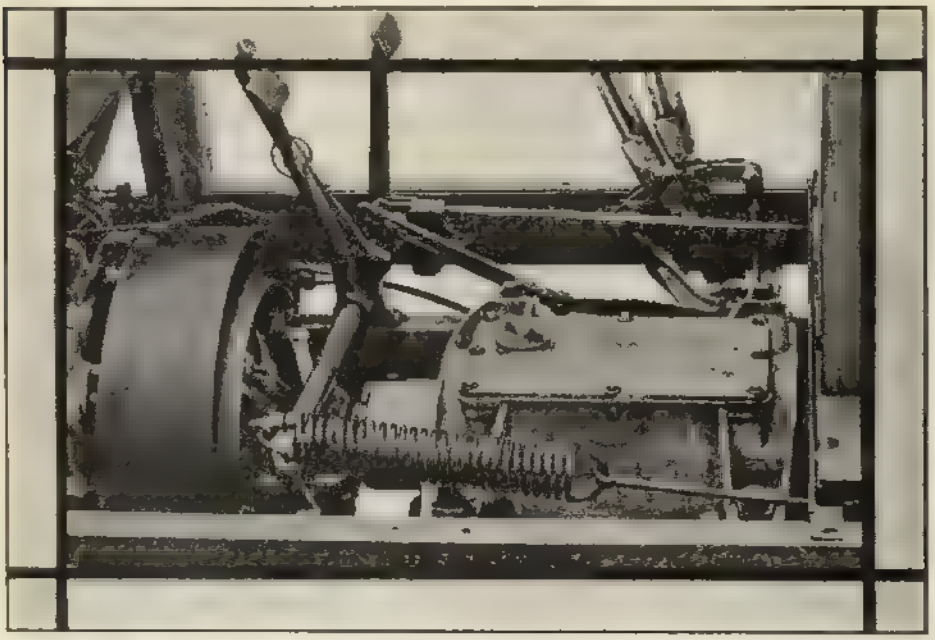

Fig. 7. View of the under-foot-board mechanism showing the clutch and brake pedals, the clutch and its unusual arrangement of clutch spring. This spring is placed at one side and is under tension instead of compression and operates on a cross shaft which controls the usual trunioned yoke which moves the toggle arms. Details of the control described in the text.

of which is removable for cleaning or inspection. Three speeds ahead and one reverse are provided, the sliding member being on the upper squared line shaft, the lay shaft is below and the high speed is through a lug clutch.

CONTROL.

The usual side gear shifting lever operating on the progressive principle on a quadrant mounted on the inside of the side frame members controls the speeds. On the same quadrant is the pull brake lever which controls the inside expanding brakes on the rear wheel. These brakes are cam expanded shoes, Thermoid lined. There are two pedals as shown in Fig. 7, the outer or right pedal controls the service brakes, the pull being transmitted through rods to a short shaft mounted on the rear axle and parallel to it arms at the end of which control the brakes. This service brake is independent of the clutch but the hand brake is interconnected with the clutch. The other pedal operates the clutch and is provided with a latch as shown to keep the clutch out on hills, etc. The hand brake lever is connected to the clutch by a slotted arm so that it pulls the clutch out and yet the slotted end allows taking the clutch out when the brake is off. The usual spark and throttle levers are arranged on the steering wheel on the stationary sector, but this is on the left side instead of the right, this being considered a more advantageous position. A foot accelerator pedal is also provided.

THE DRIVE AND REAR AXLE

The drive is by a square shaft unin-closed, fitted with two autocar universal joints the forward end of which is a slip joint, these universal joints are the same as have been used for several years and are of the cross type, provision being made at the outer ends of the arms for adjustment. The joints are self-oiling. The rear axle is of the semi-floating type, the central housing in two portions divided in a vertical plane, is a malleable casting. Into the end of this by flanges are cap-screwed tubular malleable cast housings with integral spring supports and arms for the short auxiliary brake shafts, a Brown-Lipe differential is mounted at the center by means of a hub at each side of it on Hyatt roller bearings and is also provided with thrust bearings on each side. The outer bearings are Timken rollers mounted on the axle itself, the inner cone of the bearing abutting against a rigid collar on the shaft and ends of the shaft are so arranged that they touch, so that side thrust on the wheels from either direction is taken by one or the other of the Timken bearings. This construction also permits of the removal of the live axles without disturbing the differential in a similar manner to the full floating rear axle. The bevel pinion is unusually well supported by having a Timken bearing in front and at the rear end.

The front axle is of I-section, Timken drop forging in one piece without weld.

The spring seats are forged integral and the stub axles are 1½ inches diameter and fitted with Timken roller bearings.

THE ARMORED WOOD FRAME

The frame is made of selected ash 1½x3½ inches in cross section, reinforced on the inside by a vertical plate of the same depth as the sills and provided with gusset plates at the corners. The front cross frame member is a malleable iron casting

Fig 8. View of the 1910 Type XX Autocar rear axle. This is entirely Autocar design and construction and uses Timken roller bearings at the outer end of live axle on each side of the differential, which is supported independently on short tubes of its own. The construction is such that the halves of the live axle can be withdrawn without disturbing the differential

forming a saddle for the radiator and at the rear end of the subframe, which is of pressed steel, channel section, is another malleable iron cross frame member of T bulb section. The forward spring horns are steel castings into which the ends of the wood sills fit, the left spring horn has a small integral loop cast on it to hold the strap which supports the starting crank and in a similar way the front cross frame member is provided with integral loops for the straps of the number plates, these are mentioned to show that the minor details are taken care of in the original design.

The Gemmer steering gear of worm and sector type is employed. This is well supported between the sub and main frame and connected by the usual ball and socket adjustable end rods to the steering knuckle, the cross connecting link being behind the front axle in a protected position.

SPRINGS

The front springs are semi elliptic, 2x36 inches, and have six leaves clipped and banded and rest on hickory saddle blocks which it is claimed make a secure fastening and one which is not apt to break the springs. At the rear the popular scroll end full-elliptic pattern is employed, these springs being 2 inches wide, 5 leaves top and bottom and 40 inches in length over all. The upper half is clipped to a malleable iron casting, bolted through the wood sills and steel inner armor plate.

No torque rod is supplied and the radius rods are tubes with turn buckle adjustments and are pivoted at the rear ends.

The rear wheels are fitted on tapered ends of the live axle halves and keyed. All wheels are mounted on Timken roller bearings, are of artillery type and are fitted with 34x3½-inch tires, the make being optional with the purchaser. The rims are Goodyear quick detachable.

The entire design goes together well, is consistent throughout and shows more carefully planning than is often found in cars at the popular price of $1750

## 1910 GLIDE CHANGES

The 1910 Glide models, made by the Bartholomew Co., of Peoria, Ill., will be practically the same as the 1909 models, the Model G special touring car with 120-inch wheel base, 34 by 4½ wheels, 4¾ by 5 4-cylinder motor will be continued without change. The Roadster, with 36 by 4-inch tires, will also be continued, the rear axle shaft will be 2 inches in diameter and the front wheel spindles will be increased.

As in previous models, a double set of large brakes will be used on the rear wheels. The drums will be of pressed steel 16 inches in diameter by 3 inches face. A multiple disc clutch, the discs being 12 and 13 inches in diameter, will be used in the flywheel. All the motors will be provided with clean-out plugs near the top of each cylinder to facilitate the removal of carbon. The company announces that it will build only 45 H. P. cars and has no intention of making any low or medium-priced models

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The Courier Car Co., a development from the Dayton Motor Car Co., Dayton, Ohio, is arranging to place the Courier car, a $1000 model, on the market for 1910. It is said the arrangement will be very similar to the Stoddard-Dayton cars, but smaller. Nevertheless, it is claimed the machine, although selling for $1000, will be strictly high class.

# THE 1910 CORBIN

BY C. E. MORRIS.

In common with many other American manufacturers, The Corbin Motor Vehicle Corporation, of New Britain, will produce but one chassis in 1910, fitted with a 4-cylinder water cooled motor, though when desired, the well known air cooled motor may be had, each with a 4½-inch bore and 4½ inch stroke. The Corbin engineers rather favor the greater bore than stroke type of engine. All Corbin types, excepting the enclosed cars, sell for $2,750, the latter demanding $3,750 and considering the nicety of Corbin workmanship and construction, this latter figure for a closed type of vehicle is very reasonable. The Corbin has long been designated as the "full jeweled" car for the reason that in its construction, the use of annular ball bearings is very general. That the Corbin has been a successful car goes without saying, and actual service has proven it the equal in performance of many other cars costing a much greater amount. It likewise possesses features of up-to-date construction not found on many higher priced machines and the care in manufacture, in selection of materials, the attention bestowed upon the little details, is commendable and such as to make for a reliable product under all service conditions. The 1910 Full Jeweled Corbin presents few departures from previous Corbin practice, and, none of them at all radical. In fact, such changes as do mark the 1910 model, rather tend to give the purchaser a little more for his money.

## SOME CHANGES.

The front springs have been shortened, the Bosch magneto which is now furnished as regular equipment, is relocated and

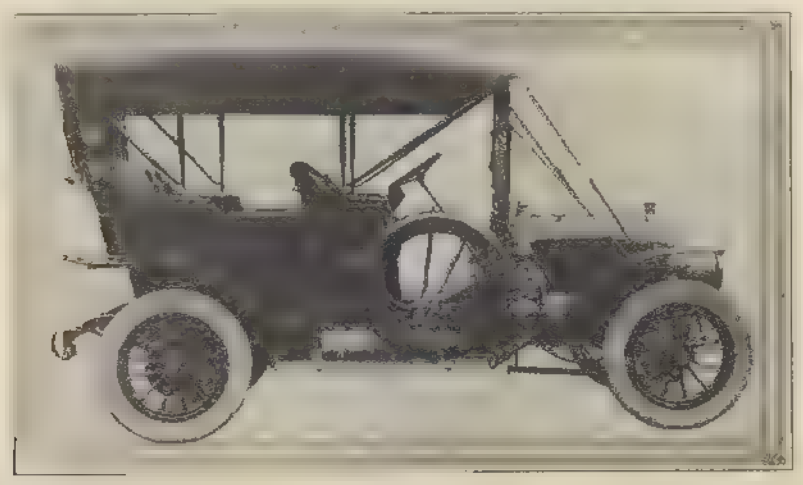


Fig. 1. 1910 Corbin Full Jeweled car. Few changes are been made for this coming season. These few only detailed in the text. Cylinders are cast separately with all valves on one side. Bore 4½ in.; stroke, 4½ in. Coil ignition using Bosch magneto. Four set of brakes on rear wheel drum, selective sliding change gear, shaft drive I section front axle; semi elliptic springs at the front, scroll and rear springs. Tires 34 by 4. Wheel base 116 in. and on the limousine 116 in. Price $2,750 or limousine $3,750.

driven by two gears forward of the engine fly wheel and a new type of eccentric oil pump has been substituted. This is driven by the same gear which actuates the vertical column distributor of the battery ignition system. The fan support is redesigned and fitted with a spring tension device for the rope pulley drive. The rear driving axles are of vanadium steel

MOTOR

The motor of the Full Jeweled Corbin, aside from the relocation of the magneto and new type oil pump, presents no changes to speak of. The valve gear remains the same and the cylinders as in

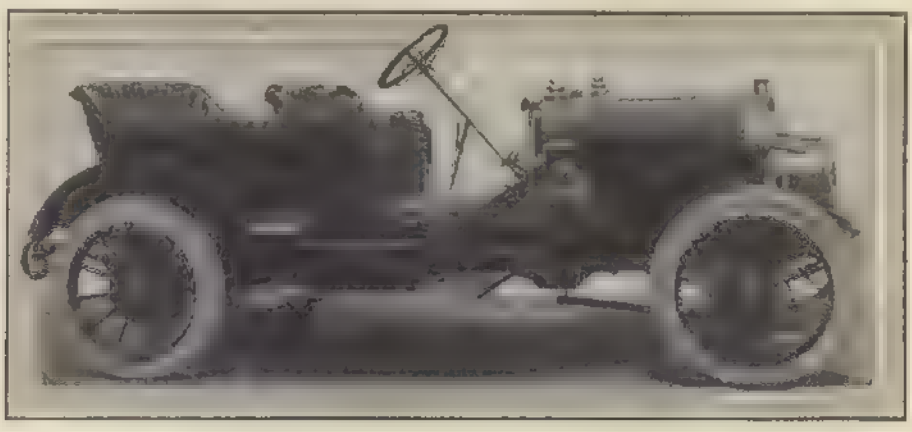
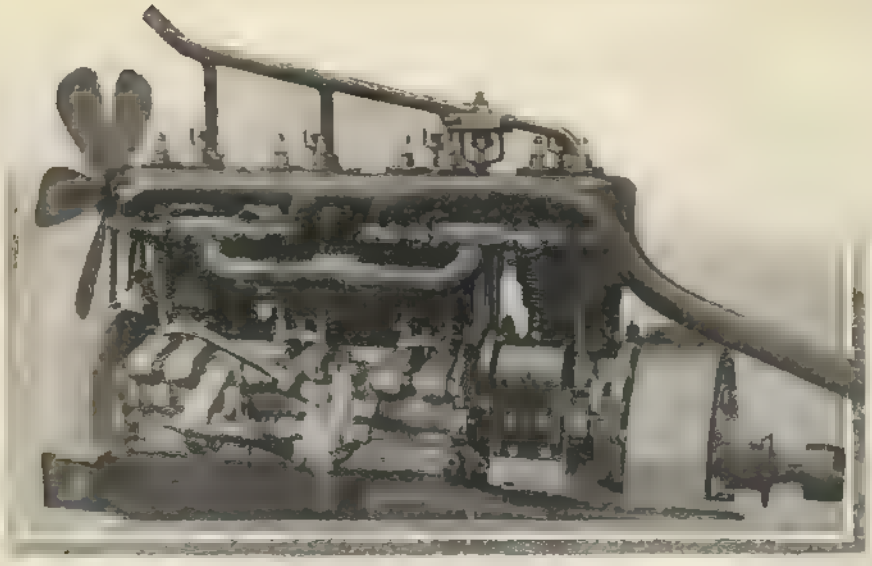


Fig. 2. [illegible] with low [illegible] speed [illegible] of front seats. Price $2,750. Equipped same as [illegible] Price with [illegible] is [illegible]

past models are single cast units making it possible to employ a five bearing crank shaft. All valves are of nickel steel and located on the left side of the motor looking forward and are actuated by a single heat treated cam shaft ⅞ inch in diameter. The cams are pinned and keyed The cylinders are of selected gray iron bored and reamed. Each cylinder unit is secured to the upper crank case section of aluminum by four steel bolts, ½-inch stock, 11¼ inches long. The two forward cylinder bolts of the number one cylinder are of the same size stock but are 13 inches long, and, as do the other retaining members, pass through the lower case section as well as the upper. The forward bolts also serve as anchorages for the forward motor support. That is to say, they are secured to an I beam section steel cross member and form a strong point support for the forward part of the motor. All valves are covered by brass screw plugs in which are retained the spark plugs, there being one plug to each brass screw cap, since the ignition is double. The same form of valve mechanism with adjustable push rods is retained since it has proven very satisfactory in past models. The valves are not actuated from the cams direct as in ordinary practice Instead drop forged steel arms carried in separate aluminum cam housings cast integral with the upper section of the crank case are anchored at one end and work between the cam and valve lifters As the cams are brought into play, the yokes impart a direct vertical lift to the valve stems, which, by a lock nut device, are adjustable The valve plunger guides are clamp bolt retained, there being one clamp to each pair. The valve springs are of special spiral steel. The Corbin method of valve construction makes for quiet valve action. The water pump is located midway between the front and rear pairs of cylinders and the construction is such that, by the removal or loosening of a castellated nut the entire pump assembly may be withdrawn with ease. The water pump is actuated by a train of gears driven off the cam shaft and provided with a spring drive device which obviates trouble in cold weather. In case the pump should become frozen, the breaking of the spring will prevent damage to the pump

A unique feature of Corbin construction is the retention of the exhaust and inlet manifolds. Four steel clamp bolts retain both manifolds in place, making their removal a simple matter. All motor pistons are ground to size, and are of selected cast gray iron fitted with four gound eccentric rings. All valves are of special valve steel 1 7-16 inches in diameter and interchangeable. The pistons are ground to a taper, and vary in diameter from 4 1000 at the bottom to 6½-1000 at the top. There are four oil grooves, ¼-inch wide and 1-32-inch deep. The new type eccentric oil pump is driven off the cam shaft and located at the base of the vertical distributor column, one gear driving both pump and timer. Connecting rods are of I section drop forged steel, the wrist pin end being solid, while the crank pin end is split, and hinged The lower



[illegible] and left side of [illegible] motor. Valves on opposite sides. Right [illegible] The forward end of [illegible] is supported by a [illegible] section steel cross frame member. This view shows the [illegible] driven by a train of gears through a sprocket drive lever from the crank shaft. The entire power assembly [illegible] removed by loosening a couple of [illegible] bolts. Note the accessible position of the timer at the top of [illegible]

section is secured to the crank pin by one large steel bolt and castellated nut. Adjustment of bearings is thus rendered a simple matter. Connecting rod bearings are of Parsons white brass. The crank shaft is of 45 point drop forged carbon steel, five bearings, the front and rear being provided with F. & S. annular ball bearings, while the intermediate bearings are of Parsons white brass. The crank pins are 1½ inches in diameter

The inlet pipe is of copper and the exhaust of steel tubing, the water piping being copper also. The connection from the water pump is likewise of copper tubing and passes from the left side of the motor between the first and second cylinders to the inlet water manifold, of neat design on the right. The discharge piping for the water system is of copper ¾ of an inch diameter enlarged to 1 inch at the outlet. The aluminum crank case is in

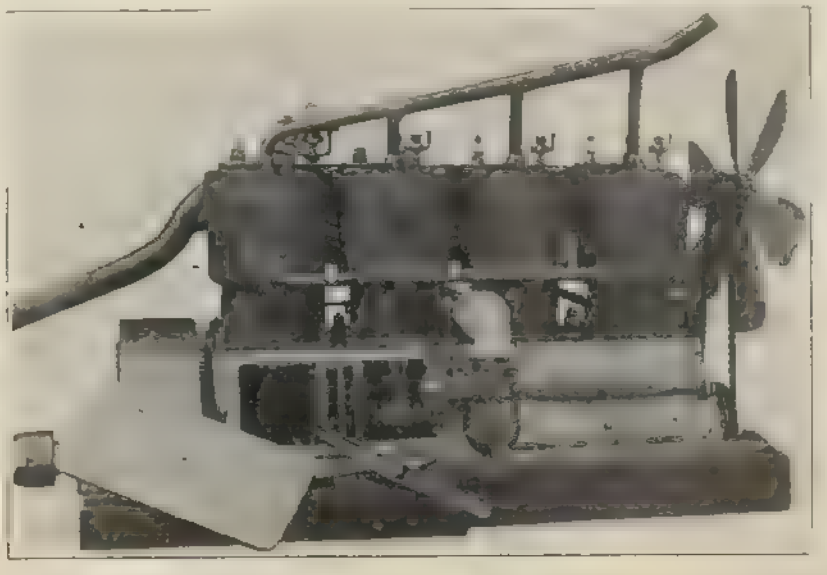


Fig. 4. Side of 4-cylinder 1910 Cole motor showing the carburetor and the [illegible] which [illegible] plates which are large enough to [illegible] give complete access to the [illegible] of the crank case as shown [illegible] this one removed. The fan is mounted on a bearing [illegible] such a way that a coil spring [illegible] keeps the belt in proper tension.

two sections, the lower half being retained by the motor studs holding the cylinder units to the upper section, a most simple form of construction. The motor bearings are carried in the lower case section and the removal of a cylinder unit does not disturb the adjustment. Two large hand holes on the left side of the motor permit of ready inspection of the working elements and all adjustments may be made through these openings. These hand hole covers are retained by a large pressed steel yoke and a turn screw. Each cylinder is provided with a relief pet cock. The magneto is relocated in the 1910 Corbin being now carried on the left side and is driven by bronze and fiber gears off the cam shaft, just forward of the fly wheel. The carburetor is located on the right side, the manifold being carried between the second and third cylinders to the inlet ports on the left, the Schebler carburetor used being water jacketed, water being taken from the head of the number three cylinder water jacket. The timing gears are carried in an aluminum housing. Cable guides are located on top of the inlet manifold

The clutch is of the fly wheel cone type tension and adjustment being provided by three spiral steel springs, set in a triangle. The female member is of course formed in the fly wheel, the male member being of aluminum, four small steel strip springs are inserted in the face of the clutch under the leather and provide a smooth engagement. A commendable feature of Corbin construction is the clutch brake. In many cars, spinning of the clutch after disengagement is a detriment to operation of the car, especially when one must bring the machine to a quick stop. A steel strip brake carried on the clutch pedal bar acts directly against the outer edge of the clutch member as it is disengaged and the tension is sufficient to check the revolution of the member without inducing undue wear. The clutch pedal operates through a multiplied linkage, through a hole in the floor board, not a slot as in common practice. The yoke or fork is provided with F. & S. annular ball thrust bearings. The clutch slide joint is fitted with four integral keys, all end thrust is of course cared for by the ball thrusts. Not only is the motor anchored forward on the I section transverse member, but it is also supported on the steel under pan which this season is of heavier dimensions.

Lubrication of the motor is by splash and force feed. The oil tank is carried under the foot boards and may be filled from the tank filler on the inside of the dash. The eccentric oil pump delivers oil to the main bearings, sight feeds being carried on the right side of the self-contained dash Delivery is through copper

Fig. 5. A look under the bonnet of the 1910 "Rutland" Corbin which shows the engine in position and the arrangement of the wires passing through the dash

pipes to the base of each cylinder where it is lifted by the pistons. The faces of the webs, and the pins of the crank shaft are drilled so that there is a circulation of oil to the face of the pins as well as the splash dip.

Cooling is by water, a large square tube radiator carrying the supply. The supply for the jackets which are of liberal capacity, is drawn from the bottom of the radiator passed through the pipe to the inlet manifold at the base of the jackets on the opposite side of the motor, the discharge taking place through the heads of the cylinders

IGNITION.

Accepted practice of to-day favors the dual or double system of ignition, and actual service deems it a wise provision The Bosch magneto, which is furnished as regular equipment for 1910, is used for the primary current supply. Disregarding general practice, the Corbin engineers have placed the magneto plugs of the high tension system over the exhaust valves. The reserve or battery plugs are carried over the inlet ports, the idea being to keep the plug points clean by the inrushing gas The distributor of the battery system as previously mentioned is located at the top of a vertical pillar and driven from the cam shaft by the same gear that serves the oil pump. For the battery system a single unit Connecticut coil is carried on the dash, the cables, however, not passing through the floor boards, but rather through the dash to the inside and thence through a fiber tube to the respective plugs. The magneto wires are carried

through guides on the inlet manifold between the second and third cylinders to the fiber tube and then to the four plugs of the magneto set. The switch is located on the dash coil.

THE CHANGE SPEED GEARS

The transmission is of the selective type with sliding gears, having three forward speeds and one reverse, the crank case and transmission are on a three point suspension, and are secured to a transverse member of the frame. The crank case and transmission are bolted together,

Fig. 6. Rear of the 1910 [illegible] car dash showing pedals to prevent the feet from [illegible] together with the sight feeds arranged on [illegible] case cover in such a way that it can [illegible] that the pedals operate through holes [illegible] shifting. [illegible] be controlled pedals of liberal wid[illegible] ial brake and gear shift levers ar[illegible] is called to the method of [illegible] this being a Corbin feat[illegible] It will also be [illegible] of slots. A clutch brake is provided to facilitate gear

forming a single unit, the transmission being to the rear of the clutch assembly with the shifting rod just underneath the removable cover. The case, as usual, is of aluminum, in two sections. Lubrication is by splash. The gears are of special gear steel accurately machined, case hardened and ground, the shafts being supported on F. & S. annular type ball bearings. The final drive is by propeller shaft fitted with two Hartford universal joints to the semi-floating rear axle. The shafts are of special steel, heat treated, and mounted in annular ball bearings with special thrust bearing. The driving pinion is provided with three annular ball bearings and one thrust bearing. A tubular steel torsion tube is fitted, being anchored to the differential housing at the rear and carried in spring bumpers just to the rear of the transmission case. The forward end of the tube is fitted with a ball connection which seats between two springs. The rear spring seats oscillate or swivel on the tubes.

The differential gears may be readily removed without disturbing the driving axles, the upper section of the housing being removable. The front axle is of the well known I-beam type, drop forged, in one piece, without a weld and having integral spring seats and steering yokes, the steering assembly being carried to the rear of the axle. The forward spring seats are secured to the axle spring seats with two heavy steel clip bolts. The forward ends of the front springs are secured to the frame ends while at the rear they are shackled to drop forged steel shackles.

The front springs are semi-elliptic and for 1910 have been shortened to 31½ inches, perched midway between the spring eyes. All springs are of special selected spring steel, the front members having five leaves, banded, graded and lipped, being 2 inches wide and 31½ inches long. The rear sets are of scroll design or triple action, having eight leaves 2¼ inches wide, graded, banded and lipped and are 50 inches long.

The steering gear is of the worm and sector type, irreversible, the sector and sector shaft being made in one complete forging, mounted on bronze bearings. Inasmuch as a complete gear is employed there is ample provision for take-up for wear.

The steering wheel is of wood, of large dimensions, with spark and throttle levers on a quadrant above the steering wheel spider. A foot accelerator pedal is conveniently located to the right of the steering column, which itself is suitably raked. In the runabouts and baby tonneau models, the steering column is accorded a more pronounced rake than on other models.

The wheels are of wood, artillery pattern provided with annular ball bearings, front and rear. Tires are 34x4 front and rear, any standard American make being furnished with the option of 3½-inch tires forward.

There are two sets of brakes working on the rear wheel drums. The foot brake actuates the external contracting bands while the emergency lever works the internal expanding bronze shoes. The drums are of pressed steel and have a 2-inch face. Either brake is sufficiently powerful to bring the car to a quick stop.

The frame is of pressed steel, hot riveted, of heavier dimensions than heretofore and herein is an added factor of safety. The side members are straight throughout their length. It is strongly transversely braced. The side members are of 1-inch deeper channel section than previous models, ¼-inch wider and of 1-16 heavier stock. The forward section of the chassis is rendered especially staunch by the steel under plates, which serve as supports for the motor. Either quick detachable or clincher rims are furnished as standard equipment which also includes, Bosch high tension magneto, mohair cape top, Prest-o-lite tank, full complement of lamps, tools, etc. The wheel base of the standard cars is 110 inches, an increase of 2½ inches over 1909. Tread is 56 inches. The wheel base of the limousine is 116 inches. The runabouts and toy tonneaus are geared 3¼ to 1, affording a speed of approximately 62 miles an hour, while the touring cars are geared 3½ to 1, affording a speed of 55 miles per hour.

# The "Little Detroit"

Recognizing that there is an unprecedented demand for a well built low priced Runabout, the Demotcar Co. which has been organized in Detroit with a capitalization of $100,000, has placed on the market the little car shown in the accompanying illustration and known as the "Little Detroit." This machine, it is claimed, has all the best features of the high priced cars yet is sold for $550 including the magneto. The distributors are the Demotcar Sales Co., 45 State Street, Detroit, Mich.

The "Little Detroit" has been designed to meet the wants of a mass of people who desire an automobile but have been afraid of the up-keep cost of the large heavy machines. The car complete, it is claimed, weighs in the neighborhood of 500 lbs. and the tire and up-keep expenses will, therefore, be very greatly reduced.

The engine has two cylinders developing six horse power and is placed under the hood at the front. The power is transmitted to the rear wheels by a planetary change gear which gives two speeds ahead and a reverse. Control is by a single side lever and three pedals. A shaft fitted with a single universal joint and mounted on ball bearings transmits the power to the divided bevel gear driven rear axle which is mounted on ball bearings. There are two internal expanding foot brakes which operate against drums in the rear hubs. The machine is comparatively low and rakish in appearance and has a wheel base of 76 inches and a standard tread. Semi-elliptic springs are used at the front and rear and the frame is pressed steel of liberal depth. The steering gear is of the rack and pinion type and the column, as

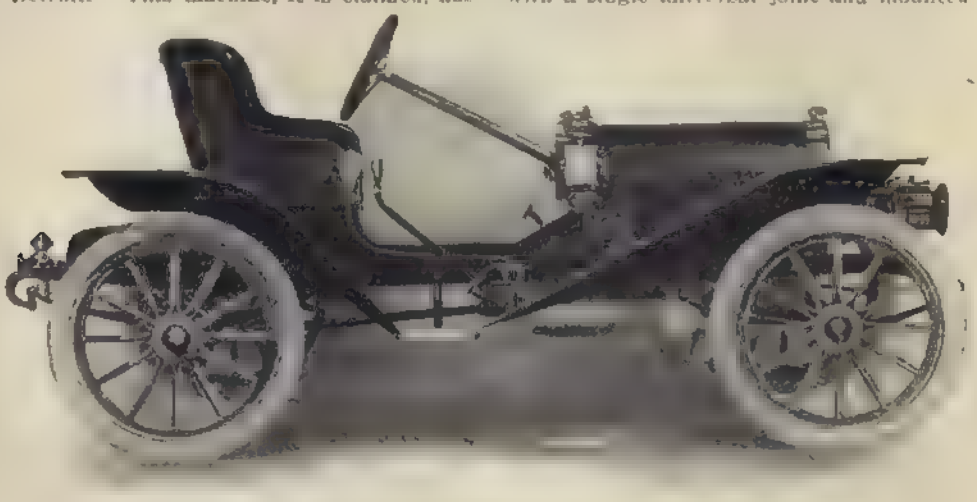
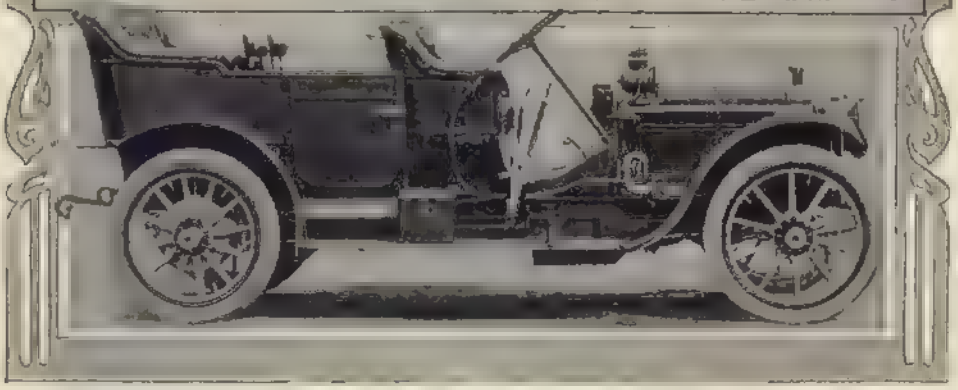


Fig. 1. The Little Detroit, a $550 car with a two cylinder 6 H. P. engine, magneto ignition. Wheel base 70 inches, read standard planetary change speed gear, shaft drive, bevel gear rear axle. Equipment: two oil lamps, tail lamp, horn and magneto.

# 1910 PACKARD CARS



In its 1910 motor cars, the Packard Motor Car Company, of Detroit, Mich., continues its previous policy of confining its product to one quality and of making cars of this one class in two sizes, the Packard "Thirty" and the Packard "Eighteen" town car. The basis of production, in each size, is a standard chassis, which is adapted to several styles of open and enclosed cars.

The 1910 Packard "Thirty" may be obtained as the standard seven passenger touring car, as a runabout, a limousine, a landaulet, with close-coupled body or with the new Packard phaeton body. The latter body has been introduced as a practical vehicle, meeting the demand for a fast, powerful car with low seats and small tonneau. The Packard "Eighteen" is supplied as the standard five passenger open car, as a runabout, a limousine and a landaulet. Both cars are the same in design and construction, the essential differences being in size and capacity.

The chief features in which the 1910 Packard differs from the 1909 apply equally well to the "Eighteen" as to the "Thirty." Those who are familiar with the Packard car and the Packard Company's long-established policy, know that each successive model, instead of being a radical departure from the preceding one, is instead, a careful development of it. Consequently the engineering work of the Packard Motor Car Company, and the improvements in the Packard car each succeeding year, have reached a stage where the development comprehends even

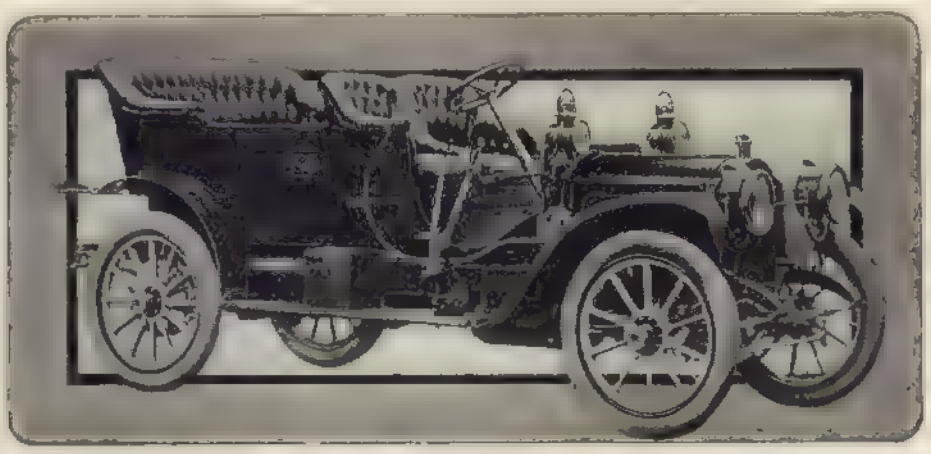


Fig. 1. 1910 Packard "Eighteen" Open Car. This new Packard is a smaller model in duplicate of the large Packard cars, that is, the same general constructions are used in the design. The motor is 4-cylinder, vertical water cooled, bore 4 1-16 in., stroke 5½-in. rated as 18 H. P., at 650 revolutions of the engine; cylinders cast in pairs; valves on opposite sides, all gears enclosed. Packard system of jump spark ignition using Eisemann low tension magneto and storage battery for reserve with unit coils in case on the dash; knife switches are provided at the spark plugs; splash lubrication oil forced by an adjustable plunger pump through the front and rear crank case compartments, two sight feeds on dash, selective three speed and reverse sliding gear, semi-elliptic springs front and rear 40 and 50 in. respectively, 113-in. wheel base standard, 102-in. runabout. Equipment: two special gas headlights, gas tank, two side oil lamps, one rear oil lamp, horn, complete set of tools and irons for carrying extra tires. $3200 standard finish and equipment.

the most trivial feature of the car, tending toward mechanical refinement.

The Packard motor is substantially the same as that of the 1909 cars, improvements being confined to the mechanical detail. In order to obtain quiet running and efficiency under heavy duty, the main crank shaft bearings are of large diameter, and consequently of exceptional rigidity.

1910 PACKARD MOTOR

The motor of the Packard "Thirty" has four vertical, water-cooled cylinders of 5-inch bore by 5½-inch stroke, developing

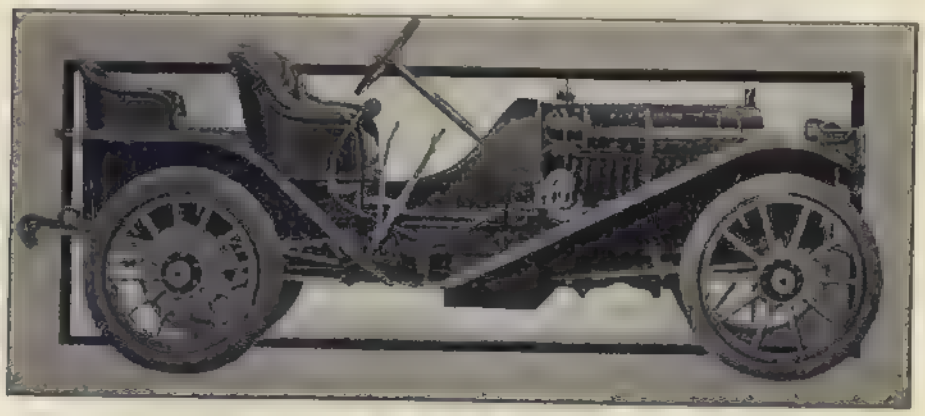


Fig. 2.—1910 Packard "Thirty" four-door tourabout. This model has the same chassis as the Packard "Thirty" touring car as shown in the first picture, but is fitted as here shown with special streamline body extending well back and cowled dash. Motor 4 cylinders, vertical, water cooled, bore 5, stroke 5½, rated as 30 H. P. at 650 revolutions, cylinders cast in pairs, valves on opposite sides. Packard dual feed, aspirating nozzle type carburetor with warm water jacket. Double ignition system using Eisemann high tension magneto with storage batteries reserved and unit coil on the dash, splash lubrication same as in the smaller model. Fig. 1. Motor controlled by a hydraulic governor, spiral spring or ratchet and sector levers on steering wheel. Dry plate clutch. No lubrication fittings, ball bearings throughout to prevent squeaking. Three speed and reverse selective transmission, worm and sector steering gear, all parts housed and dust proof. Semi-elliptic springs front 40, rear 54 ins. long, 2 ins. wide. Wheel base 120 ins. 60 ins. tread, 56 ins. wheelbase shown. Front tires 36x4½, rear 36x5, on the touring model rear tires the same, but front are 36x4. Body sheet aluminum over wood frame, weather tight fenders and bonnet. Standard finish Packard blue with cream yellow running gear, same equipment as Model 48. Fig. 1.

30-brake horse-power at 650 revolutions. The Packard "Eighteen" motor is of 4 1-16-inch bore by 5½-inch stroke, developing 18-brake horse-power at 650 revolutions. The cylinders are cast in pairs, with integral water jackets and valve chambers. Cylinders and pistons are ground and interchangeable. The pistons are fitted with four ground rings. The three crank-shaft main bearings are bushed with Parsons white brass and are supported by massive webs. All bearing surfaces are ground. The connecting rods are drop-forged. The crank pin bearings are bushed with Parsons white brass and the piston pins with Packard Special bronze. The valves are mechanically operated and interchangeable, the inlet and exhaust valves being on opposite sides of the cylinders. The cam shafts are positively lubricated and protected, being encased within the crank-case. The cam shaft, magneto and water pump gears are equally certain of lubrication and protection from dirt, being contained in a separate, but integrally cast, oil-tight extension of the crank case.

THE CRANK CASE.

The crank case is cast of a special aluminum alloy in three horizontal sections. The upper section, which forms the engine base, is supported directly on the side members of the main frame. All motor parts are completely protected by an integral web between the transverse supporting arms on each side, entirely enclosing the space between the motor and frame. The crank-shaft bearings are held between the uppermost and middle sections of the crank case. The bottom section is an easily removable oil well. The crank case is divided into front and rear compartments by a central partition, which supports the middle crank shaft bearing.

No change has been made in the carburation system. The carburetor, which is of Packard design and manufacture, is of the float-feed, aspirating nozzle type, with an automatic auxiliary air inlet. The nozzle is in the lower portion of the cylindrical and vertical mixing chamber and above it is a butterfly throttle controlling the quantity but not quality of the fuel mixture. The auxiliary air inlet, which automatically governs the intake of air to keep the mixture at correct proportion for all engine speeds, is a poppet valve under control of an adjustible coil spring. Spring tension to suit different atmospheric conditions is regulated by a small lever on the dashboard. Uniform temperature of the carburetor is maintained by the circulation of warm water through a jacket around the mixing chamber. A primary air-intake shut-off assists starting in cold weather.

THE GASOLINE SUPPLY.

The gasoline feed is by gravity, from a copper tank under the front seat. The total capacity, including reserve supply contained within the main tank, of the Packard "Thirty" standard chassis, is 21 gallons. In the case of the runabouts, the gasoline tank is on the rear of the frame and the feed is by a simple automatic pressure system. A convenient gasoline valve controls the main supply, reserve and shut-off.

COOLING SYSTEM.

The water-cooling system is practically the same, with two small but valuable improvements. The suction strainer in the pump is quickly removable for cleaning, without the necessity of breaking any water connections. The filler cap has a new type of fastening which allows it to be quickly opened and closed, and yet positively tightens it against leaking.

The water circulation is positive, by a gear-driven centrifugal pump. The radiator is of the cellular type. The capacity of the water-circulating system of the Packard "Thirty" is 5 gallons. Forced draft, to increase cooling efficiency, is obtained by a belt-driven, ball-bearing fan, so mounted as to provide easy adjustment of belt tension.

IMPROVEMENTS IN IGNITION.

In the ignition system there are two detail improvements. The primary wiring, from the battery to the coil box, is carried within a neat protecting tube. The switch handle on the coil box is made in the form of a small lever, which is easily reached and turned by the driver, either with his hand or foot.

The jump spark ignition is by the special Packard system. The current is supplied by an Eisemann low-tension magneto, mounted in the left side of the motor bed and driven directly by enclosed gears. A storage battery, for starting the motor from the seat, is always in reserve. The transformer coil for the magneto current and the vibrator coil for the battery current are arranged as a unit in a box on the dashboard. Between them is the combination hand and lock switch above mentioned. The commutator, to make and break the battery primary current, is on a vertical shaft at the rear of the motor, being driven from the exhaust valve cam shaft by enclosed bevel gears. Combined with the magneto is a distributor, which, like the high-tension wires and the spark plugs, is common to both magneto and battery systems. There are universally-jointed knife switches at the spark plugs.

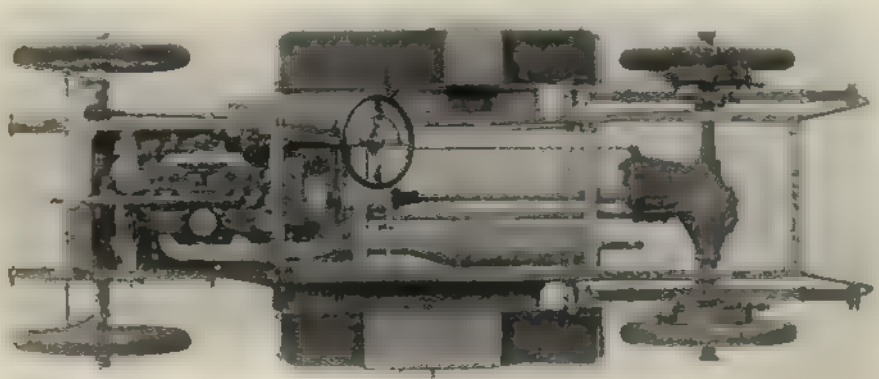


Fig. 2. Plan view of 1910 Packard Chassis showing the motor and connections to the frame, the oil pan and frame construction and the transmission rear axle. Note the length of the semi-elliptic rear springs and liberal use of grease cups at all joints also the direct pull of all brake and gear shift rods. The general arrangement of the Packard "Eighteen" is also as here shown.

LUBRICATION.

The splash lubrication system is the same simple, positive system formerly used. A double plunger oil pump feeds the front and rear compartments of the crank case, in which are independent oil levels. The oil pump strokes being adjustable, the oil feed is easily regulated. The pump is accessibly located at the left of the motor and is driven by a worm on the exhaust valve cam shaft. Oil is taken from a vertical copper reservoir close to and between the pairs of cylinders, this location insuring uniform temperature and fluid, easily-flowing oil, even in the coldest weather. The capacity of the oil tank of the Packard "Thirty" is one gallon. There are two drip sight feeds on the dashboard and the crank case drain cocks have anti-clogging devices.

Motor speed is automatically and effectively regulated by an easily-controlled hydraulic governor, incorporated in the water-circulating system and acting directly on the throttle. A pedal, cutting the governor out of action, provides for instantaneous acceleration and high speed running. The throttle also is under control of a hand lever on the steering wheel.

Another hand lever advances and retards the spark.

The starting crank, which previously has been held by a leather strap, when not in use, is now held in an upright position by an automatic latch.

DRY PLATE CLUTCH

One of the most noticeable mechanical improvements in the 1910 Packard is the new Packard dry plate clutch. This clutch affords the desirable feature of gradual engagement, and as it operates without lubrication of any kind, provides the same action in cold as in warm weather. By the use of a special lining material between the plates, the clutch will not burn, even under the severest usage

sliding gears, the third speed forward being direct drive. This gear set, as formerly, is combined with the bevel-gear final drive and the differential, to form a rigid rear axle unit, which is contained in an aluminum housing. The latter is internally ribbed to obtain maximum strength and rigidity. The differential gear unit is supported by its own bearings so that the live rear axle may be withdrawn with-

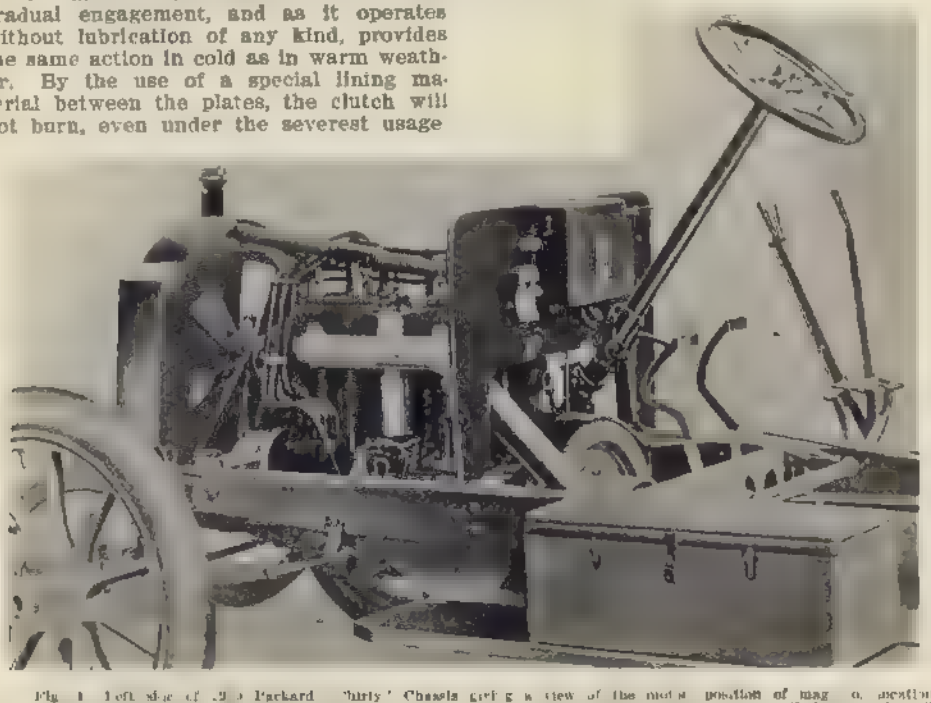


Fig. 1. Left side of 1910 Packard "Thirty" Chassis giving a view of the motor, position of magneto, section of vertical oil tank where oil is kept cold at all seasons, rear of crank showing the two sight oil feeds, unit coil box, control levers and pedals.

IMPROVEMENTS IN GEAR SHIFT CONTROL.

An addition has been made to the gear-shifting hand lever quadrant, which gives the lever a selective action in the same quadrant slot. This lever is at the rear of the single slot in the quadrant for first speed and at the forward end of the slot for third speed. The introduction of small shoulders on opposite sides of the slot allow the lever to be hurriedly and positively shifted in either direction into second speed position. Reverse is obtained by the lateral movement of the same lever into a cross slot on the inner side of the quadrant and opposite the neutral position of the lever.

The toggle operating the reverse gear, which has been an exterior feature, is now protected against dirt and mud by being enclosed within the transmission gear housing. The other general features of the transmission are the same as previously used.

Three forward speeds, providing the most efficient gear ratios for all kinds of driving, and the reverse, are obtained by

out disturbing the gears. All gears in the transmission, final drive and differential, as well as the rear axle, run on imported annular ball bearings. The extremely long propeller shaft has effectually encased universal joints at each end.

BRAKES

There are four brakes, all acting on the rear wheel brake drums, thus obviating the application of braking power on the transmission. The external contracting brakes are operated by a pedal for regular use. The internal expanding brakes are operated by an emergency hand lever. A drum disc entirely encloses and protects each internal brake. The expanding brake segments are now secured by bayonet locks, preventing rattle.

The improved steering wheel provides greater comfort for the hands, because the wood covering entirely encloses the metal rim and also extends on to the spokes. Another slight change in the steering gear is the addition of grease cups supplying lubrication directly to the steering sector shaft bearings.

The steering gear worm and sector are forged integrally with their respective shafts. The steering spindles and jaw type yokes are drop-forged. The steering connecting rod, between the steering knuckles and the steering column, is placed above the front axle in a manner which minimizes stresses and vibrations and consequent jar on the driver's hands. There are ball thrust bearings in the steering knuckles. The steering rod universal joints are encased and all steering connections have grease cups.

In general design and construction, the running gear remains unchanged. The channel section, pressed steel main frame is arched above the rear axle to provide liberal spring action without raising the body. The top and bottom flanges of the side bars have integral gussets for the reception of cross members.

SPRINGS

There are four wide semi-elliptical springs. In the "Thirty" the front springs are 40 inches long and the rear 56 inches long. In the "Eighteen," the front springs are 40 inches long and the rears 50 inches long. All spring shackle bearings are now lubricated by compression grease cups. The front axle is of steel tubing, of large diameter and heavy gauge. The stationary sleeves of the rear axle are steel tubes, pressed into and riveted within the flanged collar of the differential housing.

The wheel base of the Packard "Thirty" touring car is 123½ inches and the tread standard, or 56½ inches. The wheel base of the "Thirty" runabout is 108 inches and of the "Eighteen" standard chassis is 112 inches, while that of the "Eighteen" runabout is 102 inches. The tires on the "Thirty" are 36 by 4 inches in front and 36 by 4½ inches in the rear, except in the case of the runabout, on which they are 36 by 3½ inches in front and 36 by 4½ inches in the rear. The tires on the "Eighteen" are 34 by 4 inches, front and rear, except on the runabout, where they are 34 by 3½ inches in front and 34 by 4 inches in the rear.

EXTERNAL CHANGES

In all the standard bodies, the chief exterior differences are in the front mud guards and aprons, which have been carried farther forward to increase the protection against mud thrown backward alongside the bonnet. The lines of all of the bodies are similar to the previous cars, except that the moldings and framework around the doors, etc., have been changed to obtain simpler construction and more attractive appearance. In the runabout bodies, the rumble seat has been increased in size and depth, and is comfortably upholstered.

The capacity of the "Thirty" standard touring car body is seven persons, the tonneau being equipped with two comfortable folding seats. The body is made of sheet aluminum panels, over a wood frame work. The seats are upholstered in black, hand-buffed leather, over curled hair, with spiral spring support throughout. The tonneau is provided with brass foot rail, coat rail and several convenient pockets. There is a driver's goggle box in the front seat partition. The aluminum

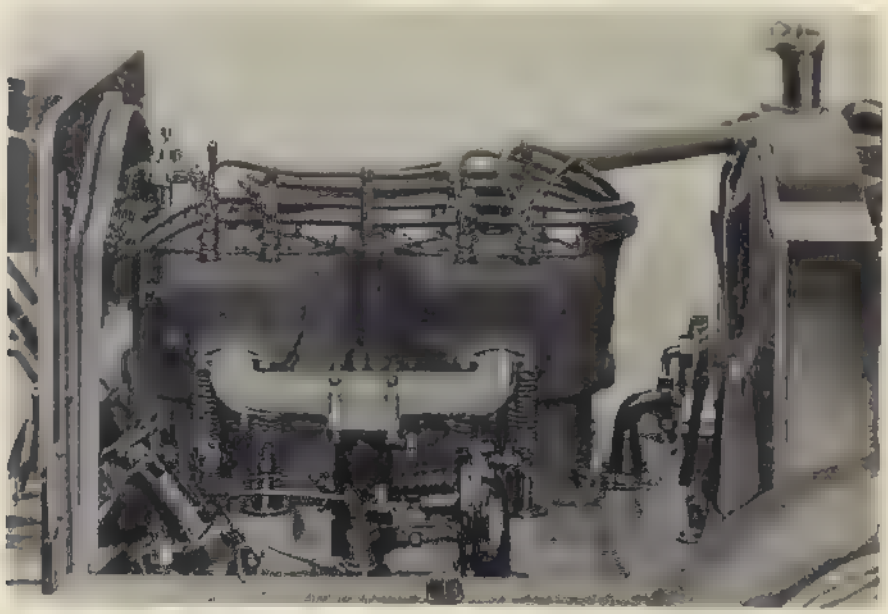


Fig. 5. Right side of 1910 Packard "Thirty" motor. This view shows the water jacketed carburetor, intake pipe, water pump and adjustable fan mounting. The knife switches at each of the plugs are also shown.

bonnet opens from either side, is readily removable and is secured against rattling The fenders are of aluminum. Both front and rear, they are so attached to the body as to be mud and water-tight. There is a metal apron between the frame and the running board at each side.

FINISH AND EQUIPMENT

The standard finish is Packard blue, with black moldings and fine cream yellow striping. The running gear parts below the frame are cream yellow, striped with Packard blue. The standard equipment comprises two Packard Special gas headlights, gas tank, two side oil lamps, one rear oil lamp, horn, tube and bulb, complete set of tools, and irons for carrying extra tires. The price of the Packard "Thirty" touring car, runabout, phaeton or with close-coupled body, in standard finish and equipment, is $4,200. The price of the Packard "Eighteen" open car or runabout, in standard finish and equipment, is $3,200.

# Pioneer High Wheeled Runabout

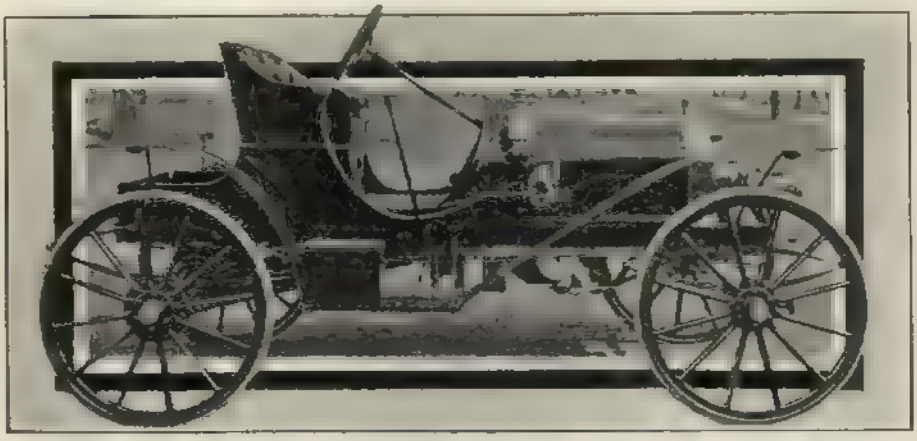


Fig. 1. Pioneer, high wheeled, two passenger runabout, wheel base, 91 inches; tires all 1¾ in "Firestone" Universal; motor 18/20 H. P. opposed, water cooled; thermo syphon system; carburetter; speed 20 miles per hour; rated at 20 H. P.; two cylinders; 4½ inch stroke; jump spark ignition; dry cells and dash vibrating coil. Transmission, planetary type, two speeds and reverse; shaft drive; live rear axle; Timken and ball bearings. Full elliptic springs front and rear. Front tread 56 inches; rear tread 56 inches. Price $[illegible]

The Pioneer Car Company, Inc., of El Reno, Oklahoma, successors to the W. R. C. Auto Works, is entering upon its third successful year in the manufacture of the Pioneer car. At the present time this concern only puts out a single model with a 2-cylinder opposed motor, but in the near future a 4-cylinder, 28-30 H. P. shaft-drive, four-passenger car will be placed on the road.

The chief advantages of the car now in use, to the commercial traveler or suburban business man, are high clearance and solid tires, doing away with expense and trouble in that line. Another point in favor of the solid tires is the possibility they afford on dirt or mud roads of running in the ruts usually worn hard and solid by wagons. The clearance of this car is about 16 inches, the lowest points being the axles.

THE MOTOR

On the cars now in use the motor is of the 2-cylinder opposed type, rated at 18-20 H. P., and giving a speed of about 20 miles per hour. The cylinders are 5-inch bore, 4½-inch stroke, and are cast integral with the water jackets. The motor, hung on a three-point suspension, is mounted crosswise, well forward under the hood. The valves are mechanically operated by adjustable fibre padded push rods. An 18-inch fan spoke fly wheel is bolted to a 5-inch flange on the crank shaft.

Cooling is by thermo syphon circulation to the vertical tube radiator

All parts of the motor are well lubricated by a 2-quart, 4-feed, mechanical force feed oiler, which is gear-driven from the half time shaft and made integral with the crank case cover.

Ignition is by jump spark, supplied by dry cells and a dash vibrating coil.

TRANSMISSION

Directly back of the fly wheel is the transmission. This is of the planetary type and gives two speeds forward and reverse. It is substantially made and runs in oil in an oil-tight case. The drive to

# 1910 Peerless Models

The Peerless models for the coming season are three in number and embody very few changes over those of 1909. The entire growth to the present Peerless cars has been a gradual one, each improvement being thoroughly tested before becoming a part of the design. Since 1906 each season's output has been but a carefully revised and refined continuation of the previous models.

All the essential parts are manufactured in the company's own works under a system of most rigid inspection. Each season new buildings and equipment have been added to the Peerless Motor Car Co.'s plant, at Cleveland, Ohio, until the present group of buildings aggregate in floor space over 8 acres.

Briefly, the models are known as 27, 28 and 29, the 4-cylinder 27, rated as 30 H. P., the A. L. A. M. rating being, however, 38 H. P., cylinders 4⅞ by 5½ and the wheel base 122 inches, while the tires are 36 by 4 on the front and 36 by 5 on the rear. This model is put out as a roadster with the same general chassis specification with the exception of the wheel base which is 118½ inches. The model 28 is a 6-cylinder machine of 4⅞ by 5½ inches, conservatively rated as 50 H. P., its A. L. A. M. rating being 57 H. P. The wheel base is 136 inches and the tires 36 by 4 on the front and 36 by 5 on the rear. The roadster of this type has 132½ inches wheel base, 36 by 4 front tires and 36 by 5 rear. The smallest of the models is known as the 29 inch has 4 cylinders, 4 by 4⅝ inches and is rated as 20 H. P., the A. L. A. M. rating being 25. The wheel base is 130 inches and the wheels are fitted with 32 by 3½ inch tires. The 4-cylinder model 27 is fitted with various bodies ranging from the touring car at $4,300 up to the landaulet at $5,800. The regular chassis sells for $3,800. The 28 6 cylinder model also is fitted with a complete line of bodies, the prices ranging from $6,000 to $7,300 for the landaulet. The small model 29, either as a town car limousine or a town car landaulet, sells for $4,500.

The standard colors for the season of 1910 are maroon for the bodies of the touring cars and roadsters and Coach Paint.

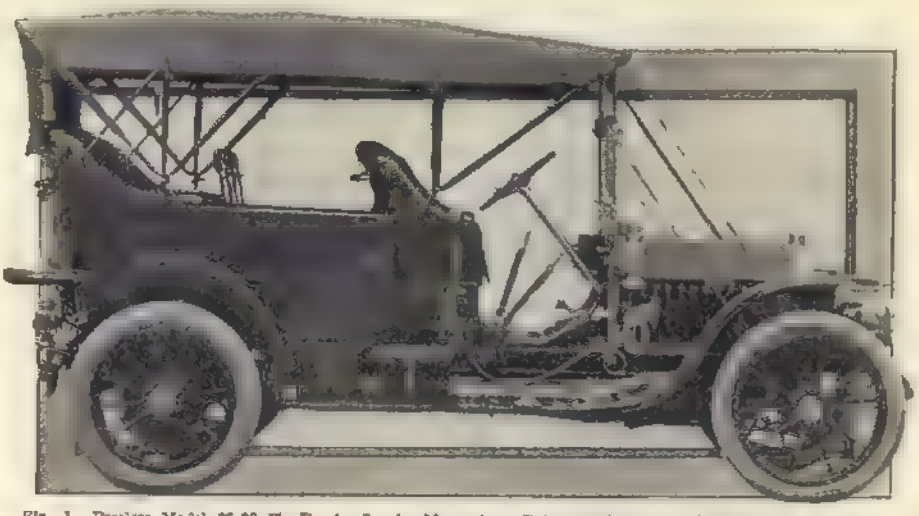


Fig. 1. Peerless Model 27 38 H. P. A. L. A. M. rating. This 4-cylinder car is known as a 30 H. P. [illegible] although the A. L. A. M. rating is higher. As a touring car with top, price as $4475; chassis $3,800. Cylinders are 4⅞ by 5½; wheel base 122 in.; tires 36 by 4 front, 36 by 5 in. rear. Self contained [illegible] system, double ignition system, or two separate and distinct [illegible] including two sets of plugs. [illegible] speeds forward and one reverse, selective sliding gear.

The two larger models, one of four cylinders and the other of six cylinders, use the same cylinder castings, these cylinders being 4⅞ bore and 5½ inch stroke. The water jackets are ample and carry a larger supply at the top than at the bottom, thus making uniform, as near as possible, the temperature of the cylinder walls. The tops of the jackets are covered by a brass plate which forms an outlet for the heated water to the radiators and also facilitates

ers' Red for the running gear, while the limousine and landaulets are finished with either red or blue, and are upholstered in imported broadcloth or with cloths of goat skin. For equipment, the usual head lights, extra large Prest-O-Lite tank, side and tail lamps are supplied and also a complete set of tools in a specially constructed box on the running board which also carries the Prest O Lite tank concealed.

### THE MOTORS

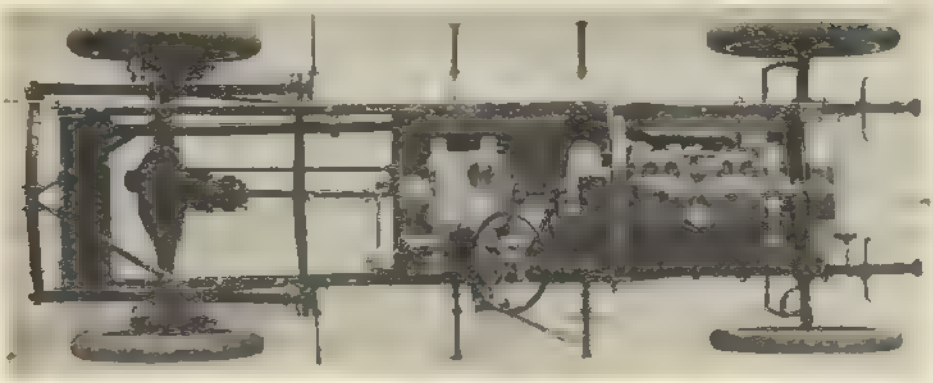


Fig. 2. Plan view of the Peerless 10 [illegible] chassis. This view shows the complete protection of the motor and clutch, speed gears, connecting rods, etc., by means of an under pan, also the well braced frame, the brake levers, the rear axle and differential housing and the method of carrying the rear cross spring.

the removal of core sand. This radiator is of the Peerless design and patented construction used on the last two models, which it is claimed, will cool the motor under the most trying circumstances. The circulation of the water is maintained by a gear driven herring bone gear pump which gives a constant and positive flow, forcing the water through the large cylinder jacks into the top of the radiator. This pump is noiseless in operation.

The crank case is a one piece aluminum casting ribbed to give additional strength. Its dimensions have been somewhat increased this season and thus provides for an increased oil supply. The connecting rods and bearings are made accessible through hand hole plates in the bottom of the case, these plates being fitted with a patented pocket or groove at the lowest point into which the dirt and sediment from the oil deposits. The valves are made of imported alloyed steel and tapered seated. The crank shaft is a one piece heat treated drop forging, ground accurately to finished size.

Careful attention is given to the balancing of the reciprocating parts and it is claimed that all connecting rods and pistons are finished to approximately the same weight. The fly-wheels are carefully balanced in a special rotary testing

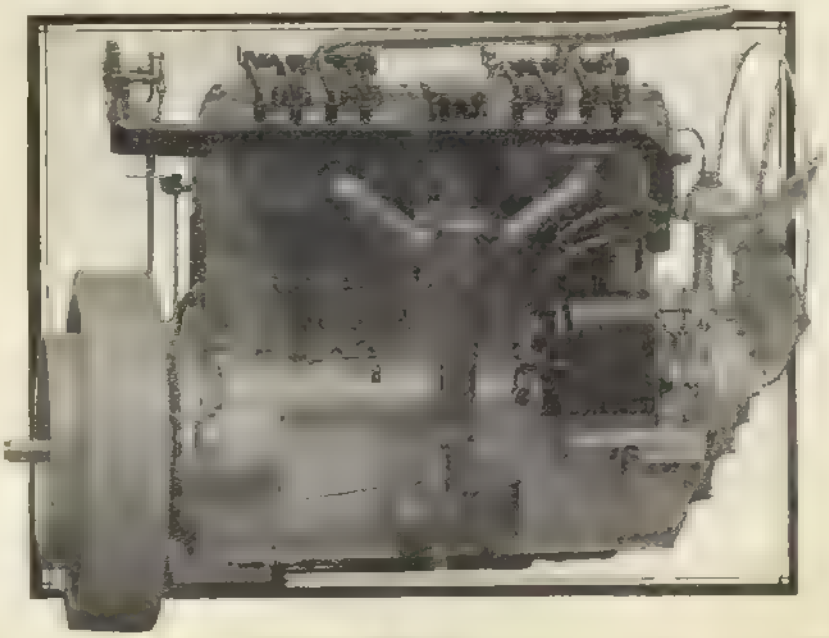


Fig. 3. Inlet side of the 1911 Peerless [illegible] by 5½ A. L. A. M. rating, 33 H. P. cylinders cast en pairs, with integral jackets and [illegible] heads over the jackets. This view shows the method of wiring, consisting of a [illegible] for each of the ends of the various wires are placed giving a simple and neat method. The ignition magneto is located on an integral arm from the crank case and shaft driven from the forward gears, as is also shown.

machine for the purpose. All the gears in the crank case come within the housing and run in oil.

CARBURETOR

A new carburetor embodying several important improvements is used on the models 27 and 28, the float chamber is lowered sufficiently so that the gasoline is supplied by gravity feed on any angle to which it is likely the car will be tipped in ascending the steepest grades. This carburetor is of course automatic in its operation. The throttle valve is a single seated one, vertically operated, providing a uniform mixture. This throttle is controlled by a hand lever on the steering wheel and also by an accelerator pedal and also by a governing device of extreme sensitiveness. All the connecting links for operating the throttle are fitted with ball and socket ends which allow for adjustment to compensate for wear, thus practically eliminating back lash

THE IGNITION

These cars are fitted not only with a dual ignition system but each is absolutely independent of the other even to the use of two sets of plugs, or in other words the timer, spark coil and battery may be removed entirely from the car, still leaving a perfect magneto system of ignition. In the same way the magneto may be removed, leaving the regular battery system as used for many years.

COOLING.

Following the very latest practice in car designing the oil reservoir is cast as an integral part of the crank case and has a capacity of about one gallon. This compartment contains a mechanical pump which forces the oil through sight feeds on the dash to the cylinders, crank case compartments and to the fan bearing. Splash is used in the crank case, the proper level being maintained by drain cocks fitted at the lower ends of short stand pipes. These drain cocks are all simultaneously operated by a thumb screw located accessibly beside the oil reservoir. A hand pump is also fitted for giving an additional supply of oil to the crank case whenever it is desired. The integral construction of this oil tank prevents leaking.

A very simple and accessible clutch of the internal expanding band type is employed which is light in weight, balanced and is claimed, stops rotating as soon as disengaged and engages very smoothly. Another feature of advantage is the ease with which it may be adjusted to compensate for wear. Between the clutch and transmission is a short alloy steel shaft, the ends of which are forked and fit in the universal joints which connect with the squared ends of the clutch and transmission shafts. This construction takes care of all twists in the frame and makes it pos-

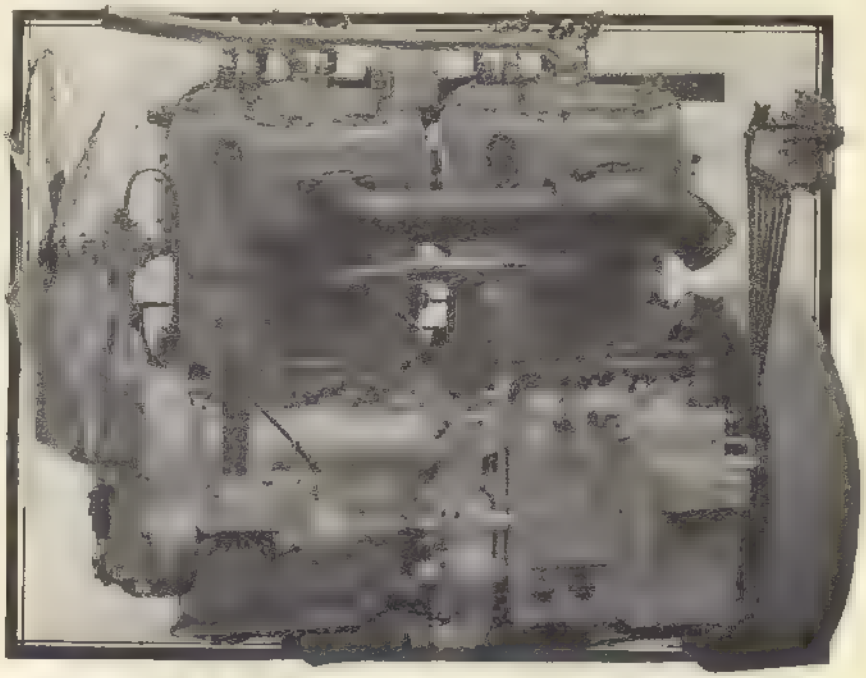


Fig. 4. Exhaust side of the Peerless 910 motor showing the oil reservoir cast integral with the crank case, Oil is forced by pump through the sight feeds at the dash, which are placed on the dash. The hand pump is arranged to supply additional oil to the crank case compartments and the pet cocks on the overflow pipes from base are for draining the crank case. These are simultaneously operated by means of the small handle shown at the left of the hand pump. Also the fan bracket showing how it is fastened to the end of the crank case and also to the method of mounting the fan on a pedestal and positively driving the same by gears

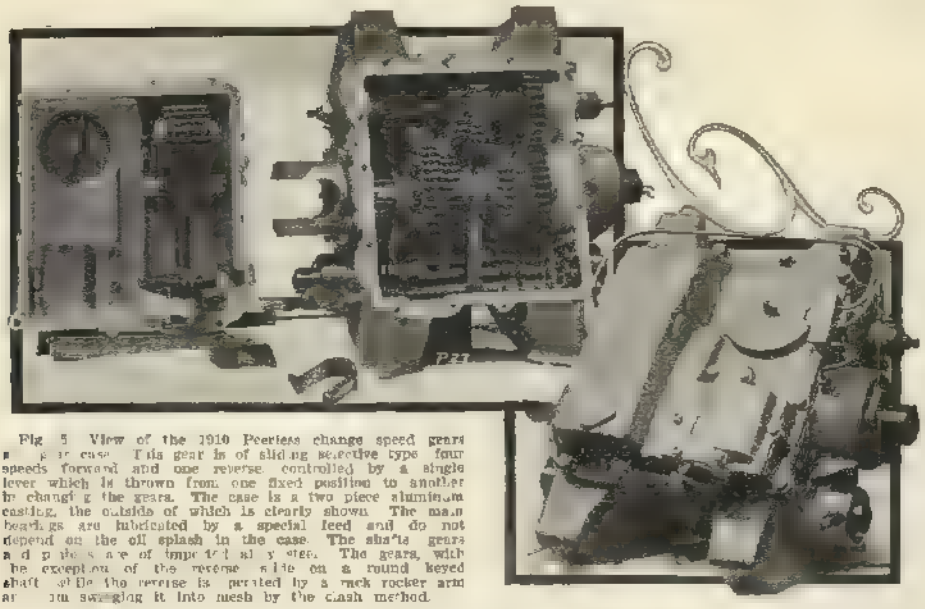


Fig. 5. View of the 1910 Peerless change speed gears and gear case. This gear is of sliding selective type four speeds forward and one reverse, controlled by a single lever which is thrown from one fixed position to another in changing the gears. The case is a two piece aluminum casting, the outside of which is clearly shown. The main bearings are lubricated by a special feed and do not depend on the oil splash in the case. The shafts, gears and pinions are of imported alloy steel. The gears, with the exception of the reverse, slide on a round keyed shaft, while the reverse is operated by a rock rocker arm and is swung into mesh by the clash method.

sible to quickly remove either the clutch or transmission without disturbing the other.

CHANGE SPEED MECHANISM

Gear changing is effected by a single side lever which controls a sliding gear of selective type giving four speeds forward and one reverse. The gear quadrant is so arranged that the operating lever is thrown from one fixed position to another, making the operation simple and one that can be done with confidence even by a comparative beginner. The change gear case is an aluminum casting and made in two parts, the base containing the transmission shaft, counter shaft and gears and the shifting bars and levers and also carrying the mechanism which locks the gears while in mesh. The clash gear for the reverse is pivoted in the upper part. All the operating parts are enclosed within the case and strength is maintained by making the parting line of the case above the centre line of the bearings. The shafts and gears are of imported alloy steel, the sliding members operating on a round keyed shaft.

By shifting the change speed gear case slightly forward on the sub frame it has become possible to change the position of the gear shift and brake lever quadrant so that these levers are now in a more vertical position and within easier reach of the operator than in previous models. Although the change gears operate in an oil bath, this oil does not lubricate the main bear-

Fig. 6. View of the Peerless rear axle construction with the housing cover removed, showing the accessibility of the spur differential and the adjusting device for the bearings. The differential case is cast steel bolted to heavy gauge steel housing tubes, with integral flanges; these axle tubes are tapered, giving great strength. The double sets of brakes are also shown. Connecting the driving gears with the live axle are special universal or Cardan joints which allow a dished position of the rear wheels as well as of the front wheels, a distinctive feature.

lugs, the latter being lubricated by means of a separate manifold oiler located at the front of a transmission case directly under the foot boards. An inspection cap with bayonet lock provides easy access to the main portion of the transmission case for inspuection or for filling with lubricant

The drive to the rear axle is by means of a propeller shaft fitted with universal joints at each end. This shaft has been slightly lengthened owing to the further forward position of the change speed case and thus gives more nearly a straight line drive. The universal joints are of the cross type, are fitted with roller bearings, and are protected from dust and dirt by telescoping leather dust shields. The torque rod instead of being of steel tubing is of pressed steel of channel section. Its forward end is supported by cushion springs enclosed in a neat tubular casing attached to a cross frame member.

SPECIAL REAR AXLE CONSTRUCTION

The weight of the rear of the car, with its proportionate load, is carried by a rear axle, consisting of three members only; the cast steel differential case being bolted on either end to flanges of the one-piece, heavy gauge steel axle tubes, which carry at their outer extremities the road wheels. These axle tubes are flared from the spring saddle toward the cast steel differential housing thus giving the axle as a whole, the greatest possible rigidity and strength, due to the constantly increasing diameter of the tubes from either end toward the center. The power is transmitted by means of bevel gears, differential and live axle shafts operating clutch plates engaging with the wheel hubs. On each side of the driving gears and connecting with the live axle are improved universal connections.

Fig. 7. Internal expanding band clutch and the gear case of the 1911 Peerless Clutch 12 in. dia. by 3 in. face. The operating yoke, the central spring and the connecting links are also shown. The bands are expanded by a differential screw action which is extremely powerful.

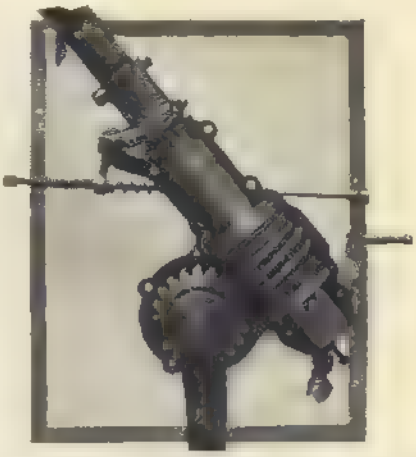


Fig. 8. View of the Peerless 1910 steering gear, which is of the worm and gear type, the gear being a complete wheel forged integral with the shaft, insuring great strength and wearing surface. Above and below the worm are self-adjusting thrust bearings.

These cardan or universal joints allow an arched axle construction and consequent camber or dishing of the rear wheels, a valuable mechanical feature which also give the cars a distinctive appearance. The cardan joints are somewhat like a positive gear clutch, the end of the axle proper having jaws similar to a spur gear and meshing with another jaw clutch shaped like an internal gear, on the differential. These jaws are of a peculiar shape to allow for universal action.

On account of the greatly increased number of engaging points over the ordinary clutch, there being 14, the universal action is more uniform, the wearing quality is greatly improved because of the fact that the driving or engaging faces are at a much greater distance from the center of the shaft than in previous types. They are made of imported alloy steel specially treated.

The housing containing the bevel gear mechanism is a steel casting split 2¼ inches above the center line, instead of exactly in the center line as formerly; therefore, the casting being deeper is of greater strength and rigidity.

Distance rods are attached to both frame and rear axle by ball and socket joints on either side and are adjustable. The car is propelled through these distance rods and not through the springs. This device together with the torque rod relieves the rear spring from all duty except that of support of the body with its load.

STEERING

The steering mechanism is of the worm and gear type. The gear being a complete wheel and forged integral with the shaft assures great strength, besides providing more wearing surface. Self adjusting

thrust bearings of special imported type are placed above and below the worm. An 18-inch hand steering wheel is used on both new models.

THE AXLES

The front axle is an imported, solid one-piece drop forging, of I section with spring saddles forged integral. The center of the front axle is the lowest point of the car. The pivot point of the steering knuckles is supported on special imported ball bearings of large size and roller bearings are used on the front wheels. A one-piece connecting rod between the steering knuckles is located behind the front axle so that it is guarded from all road obstruction.

The springs are imported from Lemoine of France, and are made of an alloy steel known as silico manganese. The front springs are two inches and the rear side springs four inches longer than those of the 1909 car, both sets being nearly flat, highly polished and very resilient. The two rear springs are attached in front to the frame and in the rear to a platform spring, attached to the center of the rear cross member of the frame, thus making a three point spring suspension. This method of rear spring suspension in combination with the drop frame, the curvature and the quality of springs gives a high degree of perfection in riding qualities.

FRAME

The frame is cold rolled pressed steel of truss pattern, with a subframe on which the engine and transmission are carried. The drop frame adopted some years ago is a feature of great importance, since the center of gravity of the car and load, is nearer the ground and yet does not interfere with the road clearance. The drop frame gives a low center of gravity and the car may be handled more easily and safely at high speeds over rough roads.

WHEELS

Thirty-six inch wheels, artillery type with dished spokes, are used both front and rear. The dished spoke construction best withstands any side strains and is stronger than the ordinary straight spoke construction. Thirty-six inch by four inch tires are used in front and thirty-six by five inch tires on the rear.

Both the front and rear fenders have been designed for greater attractiveness and to insure better protection to the car and its occupants. The front fenders are flat and are fitted with a wing which extends from the inner side of the fender to the frame and a metal fender between frame and running board prevents dust from coming into the car, hides the step brackets and adds materially to the finished appearance. The regular steps are made of metal and in attractive design.

BODY

The body is the well known and distinctive Peerless type built for seven passengers, the rear seat is amply wide for the comfortable accommodation of three, and the tonneau long and spacious. Extra seats of the folding type have been designed which are practical and comfortable and are easily removed or may be folded against the side of the tonneau when not in use.

## FEW CHANGES IN 1910 FRONTENAC

Believing that it is a far saner policy to make only so many cars that can be made mechanically right rather than producing a great quantity and have them assembled hurriedly with bad after results, President J. T. B. Bogardus and his associates in the Abendroth & Root Mfg. Co., Newburgh, N. Y., makers of the Frontenac pleasure cars and trucks, are building a conservative quantity for 1910.

It has not become necessary for the concern to greatly change their 1910 specifications from those now being used. The only decided changes are points of refinements.

Abendroth & Root for 1910 are making practically one chassis for their pleasure cars which include a limousine, touring car and roadster, all rated at 40-45 H. P. The former sells for $4,000, while the touring car and roadster are listed at $3 500. Great care is taken in the finish of the superior wood bodies of all three models and with the exception of the limousine, which is painted according to the buyer's option, the Frontenac pleasure cars are finished in dark green. The roadster has a seating capacity for three, while the touring car and limousine seats six or seven respectively. A four cylinder, water cooled motor with cylinders, 3¾ inches is used. The ignition is by battery and magneto, while the front tires are 34x4 inches and rear 34x4½ inches. The steering is a special device invented by Abendroth & Root, and the clutch is leather faced with cork inserts. There are three speeds forward and one reverse in all models.

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**Stewart & Clark Lease Chicago Quarters**—The Stewart & Clark Manufacturing Co. have leased for three years the quarters occupied by the Cadillac Automobile Co., of Chicago, 1312 Michigan avenue, and will take possession December 1. The new quarters will provide a great convenience for city trade, as it will permit taking care of city orders promptly, avoiding the delays of handling the orders through the factory. A large crew of installers will be on hand, so that speedometer installations can be taken care of there in place of sending the cars to the factory, as heretofore.

# THE 1910 HUDSON

BY C. E. MORRIS

The season of 1910 is notable for, among other reasons, that more and better general value is offered to the buying public than has been the rule in previous years. In the greater value for less money than has been asked a year or two ago, the 1910 Hudson "Twenty" stands pre-eminent, tangible proof of what is possible in the way of accomplishment when things are done according to a sound, carefully planned system. It is marketed for the first time in the season of 1910 and a word or two concerning its sponsors will be timely. First of all let it be remembered that it emanates from Detroit, Mich., that thriving western city which has become famed because of its product, especially the motor car, the reputation of which the Hudson "Twenty" will perpetuate.

The men behind the Hudson are the following: J. L. Hudson, president of the Hudson Motor Car Company, is the owner of one of Detroit's largest and most thriving dry goods houses, a man of sound judgment and business integrity. He has extensive interests in other cities and is also identified with other local institutions, a man of affairs. Hugh Chalmers, vice president of the Hudson Motor Car Company, hardly needs an introduction to the motoring public, he graced the market with one startling and efficacious creation a season or two ago and it has become notable. He is also the president of the Chalmers Detroit Motor Car Company, of Detroit. R. B. Jackson, the treasurer and general manager, is a trained mechanical engineer to whom the motor car is a source of inspi-

Fig. 1. The 1910 Hudson Twenty, 4-cylinder, wheelbase 100 in.; tires 32x3 front and 32x3½ rear; cylinder en block" bore 3¾ in., stroke 4½ in.; valves all on one side, ignition by storage battery, Bosch magneto cooling by centrifugal water pump and fan splash lubrication; selective sliding gear transmission three [illegible] and [illegible] clutch semi-floating rear axle mounted in Hyatt roller bearings [illegible] by [illegible] and expanding shoe type actuated by the foot lever [illegible] elliptic springs front [illegible] elliptic rear wood artillery wheels, 10 spokes front and 1[illegible] gear [illegible] spark and throttle levers located above 16 in. steering wheel, seating capacity two in front and one on rumble seat or if desired a twenty five gallon gas [illegible] tank is furnished in place of the rumble seat; equipment five lamps, generator, horn, tool kit, etc. Price, $[illegible] f. o. b. Detroit

ration. He is a graduate of the University of Michigan and has subsequently been identified with such successful companies as the Olds Motor Works, to say nothing of his numerous other connections. R. D. Chapin is the secretary of the company, and, also treasurer and general manager of the Chalmers-Detroit Company. His experience dates back to the early days and at one time he was sales manager of the Olds Motor Works. George W. Dunham is chief engineer and designer, is a thoroughbred

Fig. 2. Right or working side of the Hudson Twenty [illegible]. Note the symmetrical arrangement of exhaust and [illegible] manifolds, cylinders cast en bloc, manifolds and exhaust are attached separate, the exhaust being cast iron and the inlet aluminum; valves of nickel steel 1⅛ inches in diameter, all interchangeable, actuated by a single cam shaft, the push rods being adjustable, the aluminum crank case is cast in two sections and parted on the center line of the bearings. The lower section serves as an oil reservoir, supply being renewed through the breather shown at the right forward, the upper section of the crank case forms one half of the motor gear housing and has cast integral with it the fan support; fan driven by a one-inch flat belt from a brass idler at the forward end of the crank shaft on which is also carried the starting ratchet

mechanic and to him also the motor car is a thing apart, something worthy of his skill and judgment and the little Hudson "Twenty" reflects the care and thought he has bestowed upon it. After an extensive course of engineering at Swarthmore and Kenyon Colleges, he became affiliated with the American Motor Carriage Company back in 1901 and remained at that post until 1904. He then became associated with the Olds Motor Works, a sterling Michigan organization, and was designer. From 1907 until 1909, that is, up to last March, he was chief engineer of that company and his skill and judgment were amply tangible in the models turned out by the Olds Company. H E. Coffin, vice president of the Chalmers-Detroit Company, is a director of the Hudson Motor Car Company, and, obviously, is not a man to be associated with something that will not prosper. It is ostensible from the foregoing that the men behind the Hudson, in common parlance, "know their business". It was not their purpose to give the public something cheap at a cheap price but, rather, something of undisputed excellence at a low cost and the Hudson "Twenty" is the result. One look at the car is sufficient to impress that it is a vehicle approximating the highest type of accepted design and most approved practice. There is not a bad line to the car, it is complete, a finished product. That it can be made so is due to the policy adopted at the start, "one car and make that as good as you know how."

MOTOR

The motor of the Hudson "Twenty", shown in Figs. 2 and 3, is of the so-called Renault type, that is the familiar L pattern having the valves all on one side of the motor, actuated by a single cam. The cylinders are cast "en bloc," or, in one solid casting as shown in Fig. 1, with integral water jackets, the bore being 3¾ inches and the stroke 4½ inches. The crank shaft is of the well known two bearing type. The cylinders are cast of selected gray iron with liberal water jacketing completely surrounding the valve chambers ensuring the maximum of efficiency at this point. While the cylinders are cast "en bloc", the Hudson sponsors have refrained from carrying the construction a step further, that is the inlet and exhaust manifolds are separate.

The crank case is of aluminum parted on the center line of the motor bearing, the supporting arms being cast integral with the upper section which also forms one half of the half time gear housing. The fan support is also cast integral with the upper section of the aluminum crank case. All cylinders, in fact all parts of the car, where the process may be advantageously resorted to, are ground. The pistons are of special gray iron, fitted with four eccentric ground rings and provided with 3 oil ducts and are slightly tapered. The

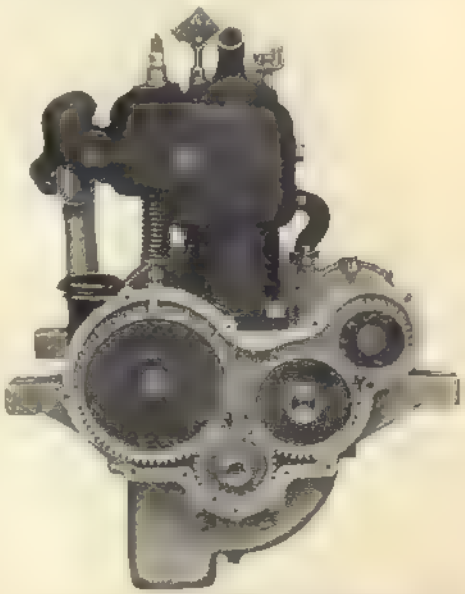

Fig. 3. Front view of Hudson Twenty motor, showing the engine gears, also the four supporting arms cast integral with the upper section of the crank case. Note cable guides on the heads of the cylinders.

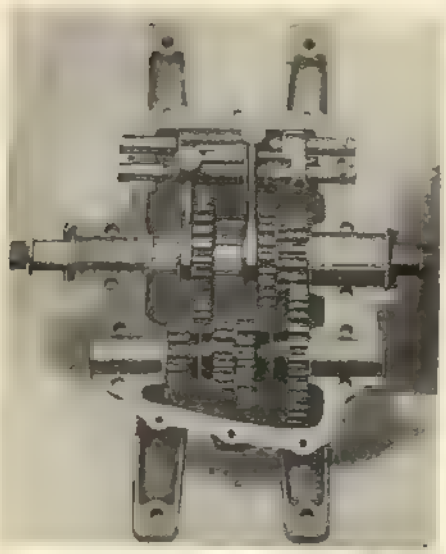

Fig. 4. [illegible] Twenty selective sliding gear transmission [illegible] speeds forward and reverse [illegible] with lower section [illegible] carefully heat treated and ground and supported in large plain die cast bearings, and provided with oil retaining chambers on outer ends of main bearings. counter shaft bearings are housed in solid oil [illegible] inch bearing on [illegible] side of case gears have [illegible] inch face stub teeth 6/8 pitch, shifting gears [illegible] on main shaft, fixed gears [illegible] ing ends or hubs and a shoulder [illegible] thrust directly against the bearings

valves, all located on the right side of the motor, are of special nickel steel 1½ inches in diameter and interchangeable. The connecting rods are of drop forged I section steel, the wrist pin being held tight in the piston by a single set screw. The connecting rod bearings are bushed with bronze and all motor bearings are of Parsons white brass. In the selection of the crank shaft the best quality of material has been specified, in fact every Hudson shaft must test up to a tensile strength of 100,000 pounds to the square inch. It is also heat treated and provided with liberal bearings, the connecting rods being, by the way, of the same material. All crank shaft bearings are accurately ground to size, bearings being 2⅛ inches in diameter. The motor bearings are retained to the upper section of the crank case, the lower section serving the sole purpose of an oil reservoir. The motor is especially staunch throughout in construction and the crank case is heavily-webbed providing added strength where it is most likely to be required. The motor casting is held to the crank case with ten ½ inch studs. The timing gears are bronze and steel and operate in grease in a grease tight case, integral with the crank case, and heavily webbed. Gears are cut and ground by the latest and most approved methods. The cam shaft is of special alloy steel with solid cams being heat treated and accurately ground. Bearings are of Parsons white brass. The valve lifters are carried in bronze guides bolted to the upper section of the crank case and provided with adjustment. While the source of current is by storage battery, provision is made for Bosch magneto which is furnished as special equipment, in which case it is located at the left rear of the motor, drive being through universal joint from the water pump shaft which in turn is driven off the half time gears. Ignition cables are of special covered rubber and are carried in guides secured to the cylinder-heads. The water pump is of the centrifugal type located midway on the cylinder sets, supply being drawn from the base of the radiator, circulated through the jackets passing out through the domes of the cylinders.

The radiator of this car is of neat vertical tube design being built of copper and brass and supported at three points. It is 2½ inches deep, the width of the cooling surface being 24 1-16 with a height of 19⅛ inches.

The fan is provided with ball bearings and is driven by a one-inch flat belt from a brass idler attached to the forward end of the crank shaft on which is also carried the starting ratchet. Just an instance of attention to details is the provision for lubrication of the fan. The hub being grease tight the bearings are protected with felt washers that, once supplied with lubricant, will operate indefinitely without much attention. The fan may be readily removed without disturbing other adjustments. The timer is located at the rear extremity of the cam shaft and just forward of the motor fly wheel. The fly wheel is 16 inches in diameter, having a 3½ inch face, and is bolted to a web on the crank shaft. The clutch is of the leather faced cone type, provided with eight flat springs inserted under the face of the leather to provide for gradual and smooth engagement. The male member is of pressed steel. The

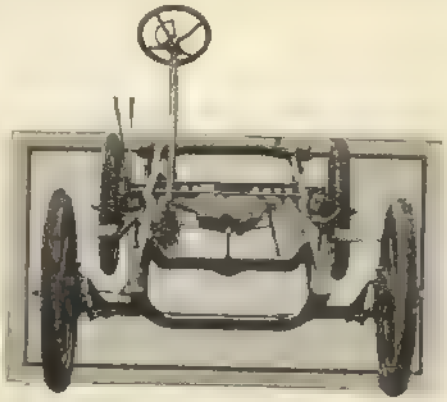

Fig. 6. Chassis of the 1910 Four-cylinder Hudson, side members are of 1½x3½ channel section frame is hot riveted throughout and framed while hot under hydraulic press the side members are lowsept forward and upswept 2½ inches at rea[illegible] affording ample clearance over rear axle; motor and transmission are carried on a pressed steel sub-frame.

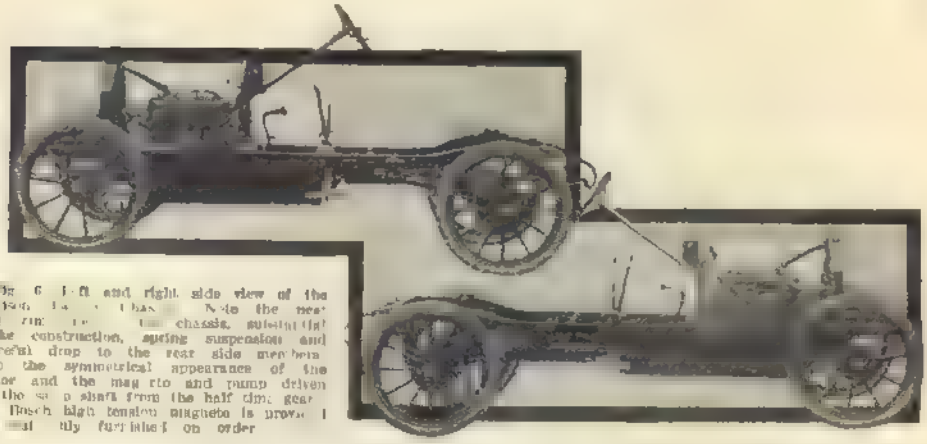

Fig. 6. Left and right side view of the [illegible] Hudson Twenty. Note the rear [illegible] chassis, suicide (?) brake construction, spring suspension and graceful drop to the rear side members also the symmetrical appearance of the motor and the mag to and pump driven off the cam shaft from the half time gear [illegible] Bosch high tension magneto is provided [illegible] fully furnished on order

inlet manifold is of ample dimensions and bolted to the motor casting with four ⅜ inch steel studs, the exhaust being of cast iron and retained by six ⅜ inch steel studs. There is not a sharp angle to deflect the incoming or outgoing gases. The spark plugs are carried over the inlet valves and each cylinder is provided with a compression relief cock. The face of the motor fly wheel is marked off so that the setting of valves when recourse to such operation may become expedient is rendered a simple matter. The core plate of the cylinder sets is of cast iron retained by four ½ inch steel studs.

Lubrication is by splash, the main supply being carried in the lower section of the crank case, and this is circulated by means of a plunger pump actuated from the cam shaft. The pump lifts the oil from the well or reservoir and forces it into the forward compartment of the crank case and from here it overflows back into the remaining three compartments, finally passing out by the overflow through a hole provided for the purpose in the rear of the crank case back into the oil well to be again circulated by the plunger pump. The walls between the four compartments and the side of the overflow are of such height as to maintain a predetermined level, the connecting rods, of course, dipping and thus providing a continuous and effective lubrication. An auxiliary overflow is located at the forward end of the crank case with walls slightly above the oil level, so that all possibility of the forward compartments flooding when that end is inclined downward is precluded. Maximum and minimum try cocks are provided at the side of the oil well and a breather tube located at the right forward of the motor provides access for filling, the breather being fitted with a locking device cap. The carburetor is of the latest approved type, that is the Venturi tube, with ball auxiliary valves and is especially designed for use on the Hudson "Twenty". It provides for a wide range of speeds on all gears from high speed work in the open country to slow high gear travel in close city traffic. It is likewise very responsive and sensitive to the throttle and provides a uniform mixture under the varying climatic conditions. The muffler is of neat design and affords a very silent exhaust, the steel tubing carrying the spent gases from the exhaust manifold to the muffler being 1¾ inches in diameter.

TRANSMISSION

The transmission as shown in Fig. 4. is of the selective sliding gear type with three speeds forward and reverse, the control side lever working in a brass quadrant. The aluminum gear case is parted horizontally and supported on four arms cast integral with the lower sections of the case. The upper section is closed in solid on top and strongly rib reinforced, providing a stiff construction. The shafts are of special selected open hearth steel, heat treated, and

Fig. 7. The semi floating rear axle of the Hudson Twenty showing the brakes differential driving shaft and torsion tube, the wheels are keyed and pinned to the tapered outer extremities of the driving shafts

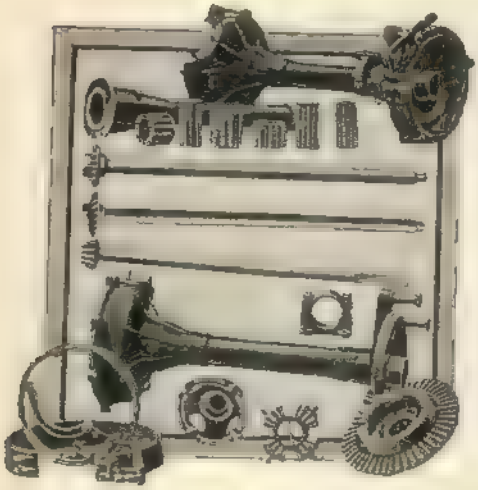

Fig 8. The rear axle of the Hudson Twenty disassembled, showing the internal gear, pinion, differential pilot bearings, the driving shafts, propeller shaft, brake tube and differential gears.

accurately ground. Bearings are of Parsons' white brass and fitted with oil retaining chambers on the outer extremities of the main bearings, while the counter shaft bearings are closed in solid. Oil pockets are arranged over each bearing on the inside of the case with large ducts passing through the bearings proper, there being retained in each bearing duct, three layers of 80 mesh brass wire gauze ensuring absolute filtering of the oil in circulation. Gears are of the best selected stock, that is, open hearth steel, carefully heat treated and ground and hardened. The gears are of ⅝ and ¾ inch face and cut according to the most approved methods with stub teeth having a 6-8 pitch, and are pointed to provide for easy shift. The shifting gears are actuated by four keys integral with the main shaft, the fixed gears being firmly keyed with abutting hubs and a shouldered shaft, thus taking the end thrust directly against the bearings. The positive clutch is of the integral gear type which renders the shift to third speed especially quiet. The shifting mechanism consists of two forks with long hubs sliding on stationary bars and a spring ball check is carried in each sliding member which drops into a groove provided in the stationary bars and registering with the various gear positions. A simple and effective interlock is provided so that to operate more than one train of gears simultaneously is an impossibility. Lubrication of gears is of course by splash and the supply may be removed through the drain plug and renewed through the filler as often as necessity may require. Final drive is by propeller shaft of nickel steel 1¼ inches in diameter.

The clutch of the motor is supported on an extension of the crank shaft by means of a heavy bearing being forced into engagement by a heavy helical spring, thrust being cared for by a ball bearing. The rear extremity of the clutch hub terminates in a block and trunion type of universal joint with a short propeller shaft to a similar joint on the forward end of the main transmission shaft. The wearing surfaces of these joints are carefully ground and hardened and a tubular leather boot is clamped over the abutting ends and filled with grease which provides ample lubrication for both joints and clutch spring and, in addition, a grease cup still further ensures proper lubrication of the working elements. The double universal joints compensate for uneven road conditions and provide for the easy removal of the clutch. The rear universal joint is of the pin type located directly to the rear of the transmission, delivering the power to the rear axle shaft and resisting the torque of the axle drive by means of the tubular steel casing concentric with the propellor shaft. The wearing surfaces of the rear joint are of ample dimensions capable of resisting long hard service and are of high grade steel carefully heat treated, hardened and ground. The working elements of the joint are enclosed in an oil tight case and when this is filled with lubricant, it suffices for two or three thousand miles of driving. A filler hole renders renewal of lubricant an easy and simple operation.

### THE CHASSIS

The chassis, shown in figures 5 and 6, is of pressed steel hot riveted channel section, formed while hot in a hydraulic press. The side members are of 1½ inches by 3½ inches channel section inswept forward, providing a short turning radius, upswept to the rear for ample clearance over the rear axle, wth a drop of 2½ inches. The transverse members as well as the sub-frame are of pressed steel and rigid construction, provided wtih gusset plates. Both motor and transmission are supported on the pressed steel sub-frame, running board brackets are of drop forged steel. A generous underpan protects the working members from the elements and is easily removed when necessary.

The rear axle, figures 7 and 8, is of the semi-floating type fitted with Hyatt roller bearings, the wheels being keyed to the tapered outer extremities of the axles. The differential case is of cast steel heavily outside webbed; and the axle steel heavily outside webbed; and the axle tubes are of the best quality drawn steel and carry the weight of the car load. The bearings are of ample sized hardened and ground rollers running on surfaces similar ly treated with all end thrust compensated for by ball thrust bearings. The bevel gear type of compensating gear has four pinions, the gears being hardened, the equalizer carrying the large driving gear floats in

independent bearings and the driving pinion works in the same manner so that alignment is always certain. Filler and drain plugs provide for withdrawal and replenishment of lubricant. The filler hole is located at such a height that too much oil can not be poured into the case. This of course obivates all leakage along the driving axles to the brakes. The differential housing is provided with a truss rod. The rear springs oscillate on the axle tubes and are provided with grease cups. The front axle is of the well known I-beam section drop forged type having integral spring seats, the whole member being forged of the quality stock in one piece and is heat treated. The steering spindles shown in Fig. 9, pivot on hardened and grown bearings and are supported in the wheels on concave and cone and race ball bearings. The steering assembly is carried to the rear of the front axle, tubular steel being used in the construction, there being ample provision for take up for wear. The front axle of the "Hudson" is located well forward of the radiator which adds materially to the appearance of the car. Many contemporary machines are still built with the overhang over the front axle. In the former instance there is an even distribution of weight and steering is a much simpler matter by all means.

As for brakes, the "Hudson Twenty" is well provided for, there being two sets, independent of each other working through on rear wheel pressed steel drums, having a 2 inch face. The service brake is of the contracting band type actuated by the pedal, the emergency brake being brought into play by the hand lever and working the integral expanding bands, lining being of heat resisting material, that is, Raybestos.

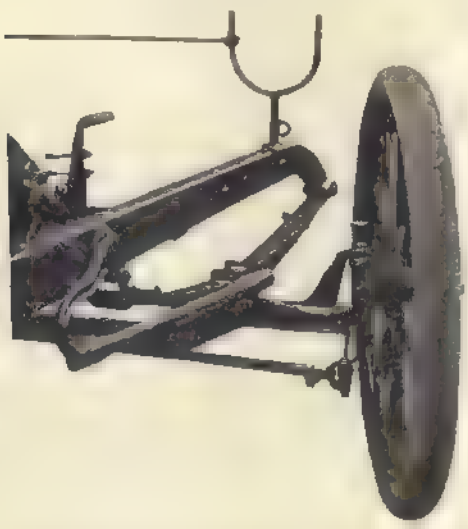

Fig 9. Forward view of one side of the chassis of the Hudson Twenty, the cross connection of the steering gear is carried to the rear of the front axle and is thus free from road obstructions. Note the method of shackling the forward springs.

The spring equipment of the "Hudson Twenty" is of the most approved pattern, semi-elliptic forward and three-quarter scroll elliptic rear. Not only are the axles provided with spring seats but heavy plates or saddles are carried at the tops of the spring sets, there being two clips to each spring provided with extra heavy nuts with ½ inch diameter thread. The front members are 36 inches long and 1¾ inches wide, there being five graded leaves in the fore and seven in the rear sets. The rear sets are of 2¼ inch face 46 inches long supported on a rigid pin forward to the chassis and on a 21¼ inch scroll at the rear. The forward halves of the rear springs transmit the thrust of the axles to the chassis.

Wheels are of wood, artillery pattern ten spokes front and 12 spokes rear material being selected second growth hickory. Tires are 32x3 forward and 32x3½ rear. The wheel base is 100 inches and the tread 54 inches, though for southern trade 60 inch tread will be furnished.

CONTROL.

The steering gear is irreversible, of worm and gear type. The steering column is 1½ inches in diameter and is given a comfortable rake which adds materially to the racey appearance of the car. The steering wheel is 16 inches in diameter, oval rimmed with the spark and throttle levers located above the wheel working on a stationary quadrant having a range of about 180 degrees, the levers are moved forward to adance and to the rear to retard. An accelerator pedal is also provided and is located between the brake and clutch pedals, convenient to the reach of the operator. Clutch pedals are of selected cast steel and are adjusted to any length of foot reach. The left pedal works the clutch and the right the external contracting brake bands on the rear wheel drums. The pedal pads which are integral with the arms are of semi stirrup design and have pyramid surfaces ensuring a firm grip Both levers are carried on a steel tube or rocker shaft, the brake pedal being keyed direct to this bar though the clutch pedal oscillates on the tube while a smaller member acting in conjunction with it is fastened to a rocker shaft. The clutch releasing yoke is of bronze retained by two drop forged steel levers and is provided with a grease cup. A set screw regulates the leg movement on the clutch pedal, the pedal proper being kept in contact with the smaller member by means of a heavy coil spring.

The owner of a "'Hudson Twenty" need never fear of some unauthorized party making off with his car for he can obviate all that by removing the starting crank. This crank is always held in a vertical position out of the way of the mud and water by a spring and ball check. By

loosening up slightly on the ball check the crank may be withdrawn. This is easily accomplished by bringing it to a horizontal position which allows the clutch pin to register with two slots provided for the purpose. A smooth brass grip turning freely on the crank handle spindle is fitted.

THE BODY

The "Hudson Twenty" may be had equipped with a runabout body and a rumble seat with folding back, or, if desired, a 25 gallon gasoline tank may be substituted for this rear seat. A body of this type is shown in the headpiece. All Hudson bodies are of selected No. 1 grade of ash and poplar and each is given 12 coats of paint. Trimming is of the best available material. The body is secured to the chassis by four large through bolts and rubber shims obviate that squeak so often heard on some otherwise satisfactory cars. The dash is of mahogany of the best five ply stock and of the neat and trim flat type, the edges being bound in heavy brass moulding. The bonnet ledge is of cast aluminum and supports the radiator brace rod. The bonnet is of metal and secured with a spring and hook type of fastener, the top joint being held by means of a heavy brass piano hinge. Another desirable feature of the "Hudson Twenty" is the fender equipment which is ample to ensure perfect protection from flying road matter. The Hudson fenders and mud guards are graceful in design, curving well down over the wheels, checking all flying mud and the like. These are re-enforced and rigidly secured to the fender irons and bolted to a neat and clean cut aluminum step. All vibration is obviated by proper and efficient anchorage. The regular "Hudson Twenty" equipment includes five high grade lamps and a generator, horn, complete tool equipment and the like. Lamp brackets, hand control levers, etc., are of high drop forged steel, no casting being used except in one or two instances where this form of construction is rather to be preferred. The price of the Hudson is $900 f. o b. Detroit.

ON THE ROAD.

While at the Hudson factory, the writer was given a demonstration in one of the 1910 four-cylinder Hudson Twenties in the course of which various roads were traversed, and, it may be well to mention that all this occurred in the rain. As a speed test a run was taken out over one of the best stretches that abound in that section, and the little car showed up remarkably well at high speed. Quiet action is a feature of the car at high sustained speed, and it holds the road remarkably well; there is that absence of side sway so noticeable on many light cars. The engine, both on the level and taking grades, was consistent in performance and the clutch action was very satisfactory, and just to prove that the gears could be shifted from one speed to another very quietly the operator went through the three speeds. The motor was especially responsive to the throttle and regardless of what the load might be, the performance was consistent throughout. Shortly after leaving the factory a rain storm blew up, accompanied by a stiff gale. Then just to demonstrate that the little car could traverse deep sand and mud the driver hit for the open country, where the roads are mere apologies. One vehicle after another of all descriptions follow along in the wake of the one preceding so that deep ruts are the result. Rain the day before rendered this particular stretch not the best imaginable. In some places deep pools of water were encountered and the manner in which the car held the road was commendable. The spring action was most satisfactory, and there was not that decided harsh action so often apparent in some cars, but rather a smooth easy rise and fall devoid of discomfort and one was not trounced all over the seat. As for operation of the high gear, the car can be throttled down sufficiently slow to permit of operation through the city streets, and proved to be exceptionally quick on the pick up. The clutch took hold gradually, there was no jerk or any indication of harsh engagement, just a smooth sweet action. The springs inserted under the face of the leather provide for a smooth pick-up, and a demonstration of the clutch while plowing through the deep Michigan sand was sufficient to prove conclusively that it is possessed of all the merit claimed for it by the makers. Then, again, when the slow speed was resorted to by way of test the engine behaved wonderfully well, vibration was conspicuous for its absence. The cross stay on the lamp brackets obviates annoying rattle. Back on the level stretch for another run through the open after plowing through the sand the smooth stretch was a welcome relief, and a little top speed was indulged in. The little car rolled along mile after mile with apparent ease, no sign of strain or overwork being apparent. From one speed to another and through the full range of the control various stunts were indulged in to show whether or not the car would perform consistently, and the results were most satisfactory.

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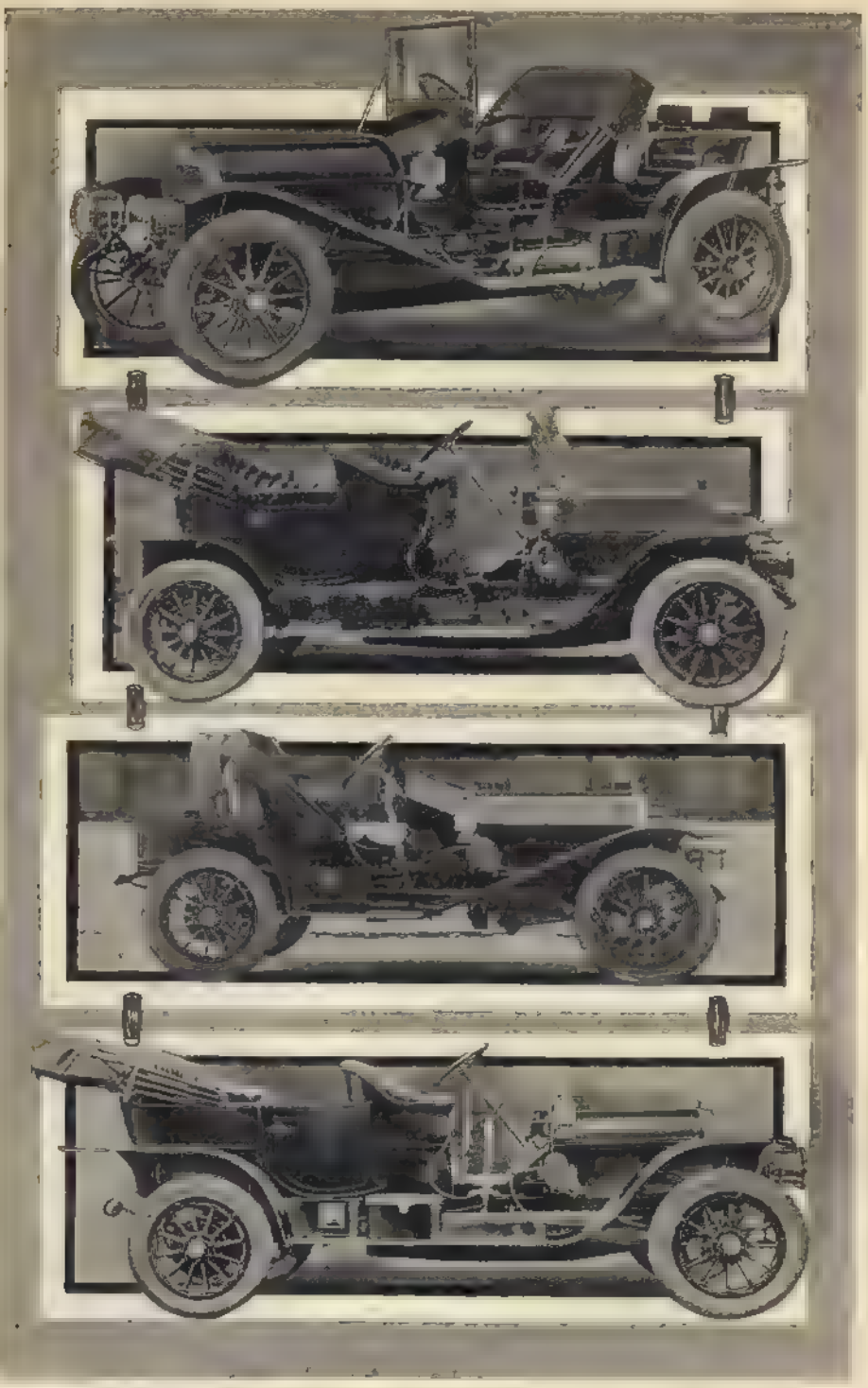
At the recent annual meeting of the Standard Roller Bearing Company of Philadelphia, held last week, the directors were elected for the ensuing year, and formally elected the following officers for the ensuing year: President, Lenox Smith; Vice-President, W. B. Osgood Field; Vice-President and General Manager, R. S. Woodward, Jr.; Secretary and Treasurer, W. M. Baldwin.



View of [illegible] model. At [illegible] is [illegible] the Model "B" which [illegible] the rear. [illegible] shown [illegible] Closed Body [illegible] Price $[illegible]. Below [illegible] is the Model [illegible] with [illegible] Price $1200. At the bottom [illegible] the [illegible] Touring [illegible] Price $[illegible].

All Knox 1910 models made by the Knox Automobile Co., Springfield, Mass., follow in a general way the construction of the Model "O" 38 H. P., retaining such special features as unit power plant, three point suspension, detachable heads, with valves in the head, straight line drive, etc

The different 1910 models will include Model "R," 40 H. P.; Model "M," 48 H P., and the new 6-cylinder Model "S", 57 H. P., all having the same construction and made in all the latest approved styles, including five and seven-passenger touring cars, tourabouts or close coupled bodies, tonneauettes, single or double rumble sportabouts, raceabouts, limousines and landaulets.

As these models are practically the same in general construction, we will give the specifications of the Model "R" only.

This model is built in all the various styles and has a 4-cylinder, 5x4¾ motor A. L. A. M., rating 40 H. P., cylinders are water cooled and fitted with detachable heads. Transmission is a three-speed selective sliding gear mounted on annular ball bearings. The clutch is of the three-plate type incased in the fly wheel and fitted with cork inserts. Drive is by a nickel steel shaft to a semi floating bevel gear rear axle. The wheel base is 117 inches and the tread 56 inches. 36x4 inch Fisk bolted on tires on demountable rims are supplied as standard equipment. Two sets of brakes are fitted to the rear wheels and act on special pressed steel drums. As a touring car, this model has ample accommodation for five persons regularly, but can easily be fitted with two folding tonneau seats making the capacity seven. The rear cushion is 20 inches deep by 52 inches wide and the foot room in front of the seat is 30 inches. With the complete equipment as detailed near the end of this article, this model sells for $3250, and as a tourabout, tonneauette, or as double rumble raceabout, $3150. As a standard raceabout with a 102-inch wheel base or as a double rumble sportabout, the price is $3100; limousine and landaulets are $4000.

CYLINDER CONSTRUCTION

All Knox water cooled motors are made with cylinders having detachable heads, with valves in the head; the same as the "L" and "O" 1908 and 1909 models, which it is claimed has proved a feature with every point an advantage, never having developed a single weakness or objectionable feature, except the additional cost of manufacture. In proof of this the makers point out that nearly all of the late long distance races have been won with motors having valves in the head.

Model "R" cylinders are 5-inch bore, 4¾ inch stroke, rated at 38 H. P., A. L. A. M. standard; Model "M" is 5½-inch bore and 5½ inch stroke, rated at 48 H P., A. L. A. M.

Both have cylinders cast separately; each consists of two distinctive castings—the cylinder proper and the head as shown in Fig. 3. The water jacket of the cylinder is cast integral therewith, the water entrance being at the lowest point, and the outlet near the top on the right hand side. In the upper end of the cylinder casting a deep concentric groove is machined in which fits a copper asbestos gasket upon which is seated a corresponding concentric tongue formed on the bottom of the head which is firmly secured to the head by four bolts. It is impossible to bring these parts together except in a correct location and with a correct bearing. This joint, it should be noted, is not a water joint; in fact there are no water joints in this construction which can possibly occasion a leak into the cylinders

By this simple construction are secured cylinders which are symmetrical in form and perfectly uniform in cross section which reduces to a minimum the liability

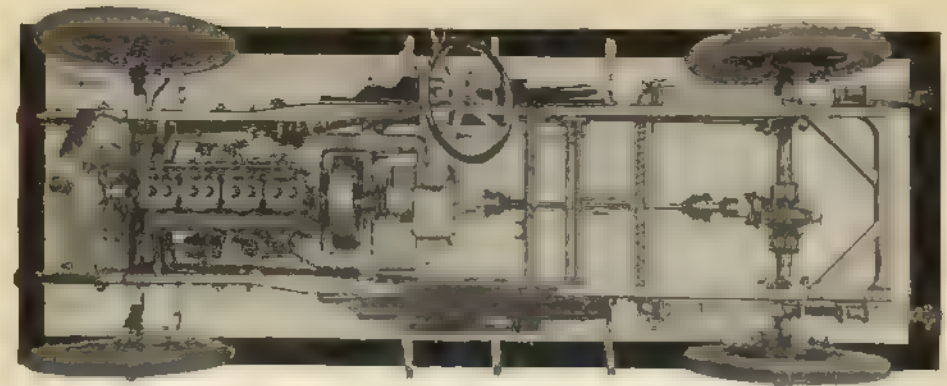


Fig. 1. Plan view of 1910 Model E Knox. This shows clearly the peculiar ... of the engine case. The valves in the ... motor and their ... Attention is called to the large brake ... be well br... ... of nickel steel, front 40 inches long, rear ... slightly ... 34 or 4 cylinder, 3 by 4½ ... cylinders cast sep... ... in the head. 40 H. P. A. L. A. M. ... plate clutch with cork inserts. Wheel base 117 in., tires 36 by 4 in., weight with equipment ... the Prices ... various models given in text.

of going out of round. Furthermore, they may be easily and accurately machined, the casting being entirely open at both top and bottom. The bottom of the head is also machined so that the entire surface of the combustion space is absolutely smooth and of the same capacity, giving a perfect balance of the volumes of all cylinders, which contributes to sweet and even running.

The head is cast integral with its own independent water jacket and the inlet and exhaust passages from manifolds to the valves are cored in the head.

The water spaces are exceptionally large, the water circulating freely around all the parts mentioned as well as around both valve seats, the head being cast with a division through it horizontally making two separate water spaces, insuring a positive water circulation directly over the valve seats, returning through the top water space to the return water manifold, the water entering the lower one through a single U-shaped hollow casting. The "U" connection and the return water manifold are held in place by a double clamp and single bolt.

In order to remove a cylinder head it is only necessary to loosen the bolt holding the "U" casting and water manifold to the head you wish to remove, unscrew the four bolts holding the head to its cylinder, loosen the clamp bolt holding exhaust and intake manifold and head can be removed in ten minutes, or all of them in fifteen to twenty minutes, thus facilitating removal of carbon or grinding of valves without getting abrasive material into the cylinder.

VALVES

Flat valves mechanically operated by rocker and push rods are located on the right side of the motor. The upper ends of the push rods are in the form of hardened cup-shaped sockets and screw in the ends of the rods for adjustments of the valve openings; they are securely fastened by lock nuts and the outer ends of the rockers with which they engage

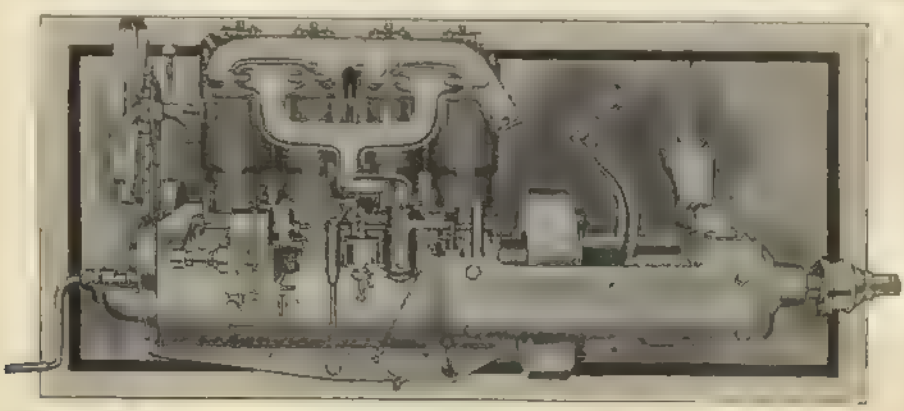


Fig. 2. Knox Unit Power Plant. The rear of the crank case is extended in the form of two arms to the rear and ... with the change speed gear case ... This power plant is supported on the forward end on a ... point and ... to the rear of the fly-wheel by two points, one at each side. The separately cast cylinders are 5 in. by 4½ in. and the heads are removable with valves in the top. A Stromberg automatic carburetor is used.

are ball-shaped. Oil is placed in the pockets preventing wear at this point. This construction allows of positive adjustment of valve rods and of the use of spiral springs for taking up lost motion

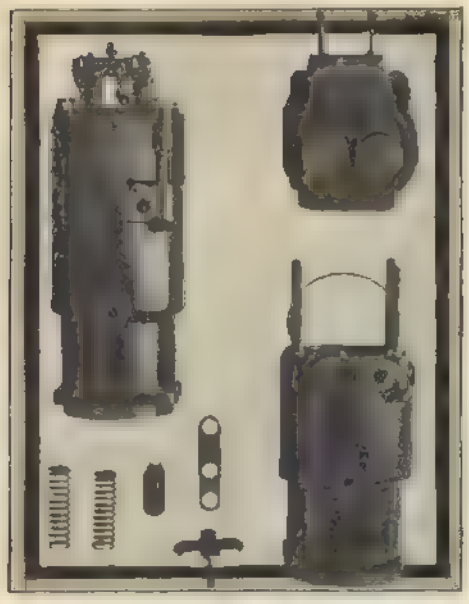


Fig. 3. Closer view of the 1910 Knox, removable head cylinders. These heads are held in place by four studs as shown and form a ground joint with the cylinder proper. The water connection is not at this joint, but through a small special by pass held in position by a yoke so that there is no possibility of any water getting into the cylinders. The size of the valves can be seen, these being as large as the cylinder will accommodate.

in the valve mechanism. It is claimed the objectionable feature of rattle in the rocker arms and push rods is entirely eliminated

UNIT POWER PLANT AND THREE POINT SUSPENSION

In all Knox 1910 models the construction of the Models "H", "L" and "O" are followed excepting the fly wheel yoke is bolted to the rear of the crank case instead of being cast integral therewith, and is composed of two side arms which are tongued and grooved to the sides of the crank case proper. The transmission case forms the rear of the yoke to which the side arms are also tongued and grooved. With this construction the transmission and side arms forming the yoke are adapted for use on any model, and have been tried out for many months, it is claimed, without showing a weakness or requiring any changes. Two points are bolted to the chassis frame at the rear of the case, about the middle of the side arms of the yoke, or near the center of the chassis, where the least twist of the frame comes, also where the fly wheel and clutch is carried. The front is carried on a flexible trunnion, hung to a bronze cross member of inverted channel section bolted to the side members of the frame. There are two other cross members with flared ends forming the gusset plates, both of which are hot riveted to the frame.

The complete power plant is composed of three separate units, the motor, clutch and transmission, any one of which can be easily removed without disturbing the other. The whole power plant can be taken from the chassis by the removal of four bolts, one on each side of the yoke at the rear, and the trunnion bolts in the center of the forward transverse frame member, the uncoupling of the forward universal joint, muffler pipe ignition wires, throttle and brake connections under ordinary circumstances would require about forty-five minutes.

THE CRANK CASE

All the crank cases are similar to the Model "M" of 1909, cast from aluminum and composed of four pieces—the case proper, the bottom of base, and the timing gear case and cover.

The case proper has a massive extension cast on each side of the rear, as shown in Fig 2, which makes when finished, one part of the forward joint for the side arms of the yoke. This casting forms

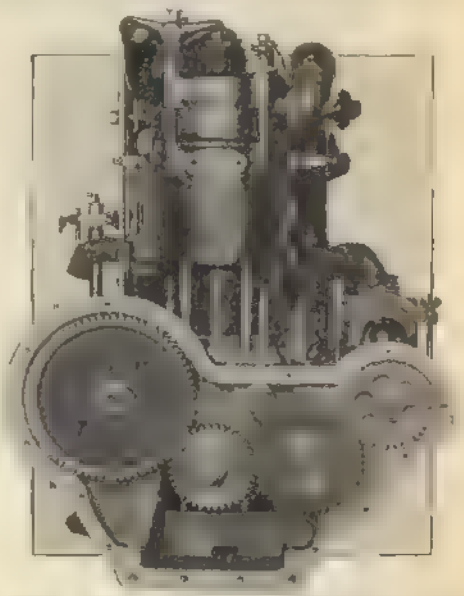


Fig. 1. Front view of Knox 1910 Motor showing the arrangement of the half time gears, the magneto gear and the four cylinder of the engine. This gives an idea of how the separate heads are held to the main portion of the cylinder on studs

the upper half of the crank case or engine bed, the crank shaft and bearings being bolted to the lower side of it. The bottom of the case is easily removed and acts chiefly as an oil reservoir. The fly wheel yoke is changed somewhat in 1910 construction, being composed of two side arms which are tongued and grooved to the sides of the crank cases, and fastened by

two bolts each. The transmission case, making the rear cross member of the yoke, is also tongued and grooved to the side arms of the yoke. With this type of suspension disalignment and the consequent cramping of parts and bearings is impossible, while the ease of assembling and disassembling will appeal to every experienced motorist.

All crank shafts and connecting rod bearings are made of Parson's white brass. With this metal it is impossible to injure the crank shaft in case of a burned bearing from lack of lubrication. The connecting rods are made from drop forgings of nickel steel sufficiently heavy to stand the strains of a powerful motor. The heads are fastened with four bolts having contracting double lock nuts, a positive fastening, the four bolts making it impossible for the bearings to wear more on the ends than the center.

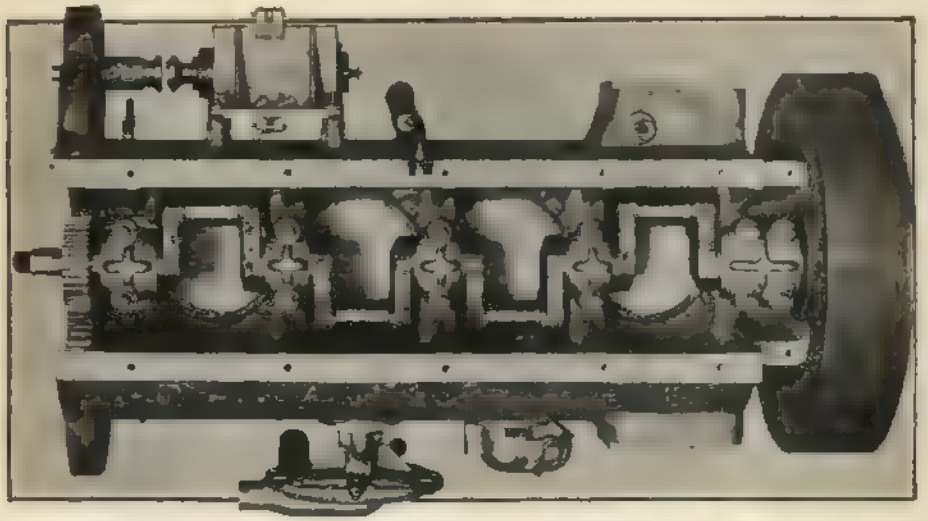


Fig. 5. Plan view of the [illegible] crank shaft, and pump of the [illegible]. This shows [illegible] and shows the five crank shaft bearings, the massive construction of [illegible] which supports the magneto. Attached to the large side [illegible]

### TRANSMISSION

The Knox transmission used in Models "R" and "S" is a new type, of three-speed selective, designed with an appreciative eye to strength and durability. The case forms the rear part of the yoke, being tongued and grooved to the side arms, and held by four bolts. A special feature, as shown in Fig. 6, is its compactness and the doing away with the use of the troublesome hollow shaft. The shafts and gears are made from nickel steel of large size, mounted on Hess-Bright and F. & S. imported ball bearings; the short shaft is only five inches between bearings, thus avoiding any liability of springing even under the most severe abuse. A transmission clutch brake is used to avoid clashing gears in shifting. The gear case can be entirely detached by disconnecting the front universal joint, removing four bolts referred to, and disconnecting the brake levers

The Stromberg automatic carburetor has again been adopted for 1910 models, after using them entirely on the 1909 product and finding them satisfactory

### WATER CIRCULATION

A circulating pump of the centrifugal type is driven by spiral gears from the cam shaft, and located on the right side of the motor is very accessible, and easily detached without disturbing any other parts. A special spring connection is used, made to snap by should the pump become frozen or stopped by dirt or any other obstruction, thus avoiding any danger of damage to gears or shafts; the pump can also be entirely drained. The water is delivered from the pump through a tapered manifold to the lower end of each cylinder jacket, thence out of its upper end, through the outside connector, into the lower chamber of the head, then into the upper chamber and out of the right side, into the return manifold and to the top of the cellular radiator. The action of the radiator is assisted by a six bladed fan, positively driven by a leather covered chain belt running in grooved wheels, kept tight by an automatic tightener

### IGNITION

Ignition on Models "M" and "R" is by Bosch high tension magneto and vibrating coil and timer; two complete systems with two sets of plugs. The magneto is located on the left side of the motor, and is driven from the timing gear case. The ignition

timer is driven by spiral gear from the oil pump shaft on the right side of the motor. All are very accessible and easily detached.

LUBRICATION

In all Knox motors what is known as the De Dion system is used. As all bearings are lubricated from the inside, the oil has a tendency to carry grit away from the bearings; while in the splash system any dirt or foreign substance in the oil is naturally carried into them. The cam shaft near the center drives a downwardly projecting shaft for the rotary gear oil pump which is fitted with a spring connection made to snap by should it become clogged The lower part of the crank case forms an oil reservoir from which, through a strainer, lubricant is drawn by the gear driven pump previously referred to and conveyed through an oil pipe on the left side of the crank case proper, from which are pipes leading to the various rotating bearings of the crank and cam shaft. In each connecting rod is drilled an oil passage, the opening of which registers once in every revolution with a similar opening in the crank pin, so that the wrist pin is not only lubricated by the oil distributed centrifugally, but by direct pressure through the connecting rod. The cylinders are amply lubricated by a mist of oil at all times present, the surplus oil falling back into the reservoir and after straining being used again.

A pressure gauge located in the sloping foot board registers the amount of pressure, which is varied at will by means of an adjustable spring by-pass located on the left side of the motor. With this system a gallon of oil, it is claimed, will last for over 500 miles of ordinary running.

The Knox power plant is inclined sufficiently to bring the crank shaft and driving shaft in a straight line, excepting the deflection due to the action of the rear springs, reducing the wear on the universal joints and also lessening loss of power through the drive. The driving parts which include crank shafts, transmission shafts, gears, universal joints; the driving shaft of 1¼ inches and the rear axle shaft of 1½ inches are all made from nickel steel.

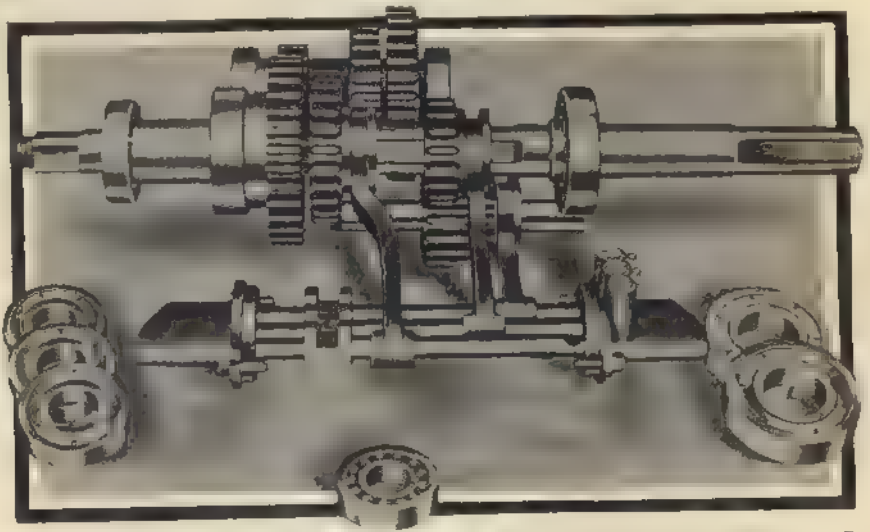


Fig. 1. Sectional view showing sliding gear of the Knox [illegible] imported F. & S. ball bearings, the nickel steel shafts and gears and the selective system of gear shift used. The ends of which instead of sticking out of the case are enclosed by the end shield.

STEERING COLUMN.

A change has been made in the steering column on 1910 models, the one employed being of the irreversible type, operated by a double right and left hand thread with a rocker action at the base, which works the steering lever. This action is positive, easily operated, and entirely adjustable or wear. The steering lever and shaft is of nickel steel and exceptionally large. The cross tie rods are placed back of the front axle and springs are used in the ball joints of the fore and aft rod, reducing shock and preventing rattle. Steering wheels are either of wood or hard rubber covered over a steel core and of 18 inches and 19 inches diameter.

CONTROL LEVERS AND BRAKES

Control is by spark and throttle, located on top of the steering wheel and by a foot accelerator. The foot brake and clutch pedals are easy of access and comfortable for the foot; one appreciable feature being the slight pressure required for their operation. The gear shaft and emergency brake levers are within easy reach on all the different types.

A special feature of the brakes is the construction of the drums, same being pressed from one piece of sheet steel, with an air space between the outer and inner drum, avoiding any possibility of either brake dragging, due to the expansion of the drum from heat when the other is applied, which sometimes happens when both act on the same drum, one external and one internal.

The service brake is of the contracting band type on the outside of the double drum, operated by pedal; the band is so fastened that it is pliable and free from

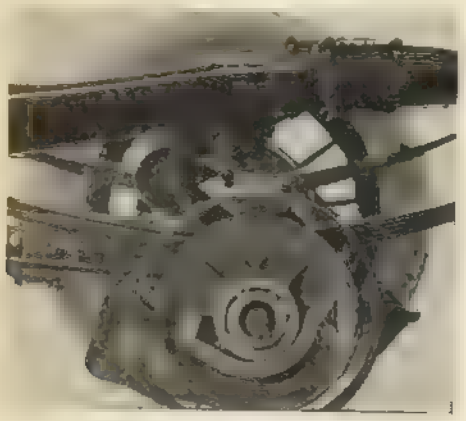


Fig. 7. View of the rear of the 1910 Knox dropped frame model 28. These brakes are operated through eveners, the double acting contracting cutter brake is pedal operated and constitutes the service brake, while the inside expanding brake is operated by an emergency pull lever. Both brakes are easily adjusted for wear

rattle, and held free of the drums when off by springs and a binder post. Adjustment is by turnbuckle, easy of access. Eveners are used on all brakes. The emergency is a hand lever pull brake of the expanding type, operating on the inner drum. All brake shoes and bands are lined with thermoid

AXLES.

The front axle is of I beam construction, made from special heat treated, high carbon drop forgings

The steering yokes are of the Elliott type, fitted with Timken roller bearings at the upper end of the pivots, making them adjustable for wear as well as easier steering.

The steering knuckles are formed of drop and hand forged nickel steel, and like the carrying yokes are of massive proportions. The front wheel bearings are also Timken roller.

A special type of semi floating rear axle, constructed so the shafts can be detached without dismounting, is employed. The shafts are 1½-inch nickel steel. The bevel gear, differential gears and other parts are exceptionally heavy.

The rear axle bearings are of the New Departure double race type, which not only gives greater bearing contact, but also takes care of end thrust; four double race bearings are used in the rear axle and two in the pinion housing.

MATERIAL.

All types of Knox bodies are made entirely in the factory. All open bodies are made of steel and aluminum, with a wooden base. A large list of standard colors is provided, from which purchasers can select. A specialty of nickel trimmings was made in 1909 and will be continued for the 1910 season.

UPHOLSTERING.

It is claimed the best quality of hand buffed leather is used in all open cars, in colors best suited to match the body colors; imported goatskin, broadcloth or Bedford cord is used in all closed bodies unless otherwise ordered.

THE FRAME AND SPRINGS

The frames are made from the best quality cold pressed alloy steel, heat treated. Two cross frame members are used besides the bronze support which carries the trunnion at the front of the power plant and the two rear points of support on the yoke, all of which help stiffen the frame; besides the rear corners are braced with gusset plates. The cast aluminum radiator support serves the same purpose at the front end of the frame.

Semi-elliptic front springs and three-quarter scroll elliptic rear are used of proper length to suit touring cars, tourabouts, tonneauettes, sportabouts and closed cars; the standard raceabouts having special springs suitable for speed cars. These springs are made from nickel steel of special alloy, and are furnished by the Bridgeport Spring Perch Company, of Bridgeport, Conn. Shock absorbers are fitted as part of the regular equipment.

The front springs are shackeled at the rear ends, the shackles being above the spring so as to work under compression instead of tension. This arrangement is adopted to prevent the spring flopping under the shackles. The lower half of the rear spring is positively connected to brackets in front and the upper half is firmly bolted to a very rigid gusset plate on the under frame.

EQUIPMENT FOR 1910.

All Knox cars are listed fully equipped at their selling prices. The following is a list of the equipment included on 1910 models:

Bosch magneto, top-side curtains and top slip cover, folding glass front, Jones' 60-mile speedometer, shock absorbers, Prest-O-Lite tank, clock, folding trunk rack, tire irons and tire cover and nickeled trimmings.

found that the solvent power of organic liquids for acetylene depended on the presence of the molecule of the compound of the carbonyl group CO. in fact, of all the compounds experimented with, we can at once put those containing this group into a class by themselves. It was further found that in general, the solubility was always greater in a given series with those compounds of low molecular weight. A few examples will illustrate this point. These determinations were made by saturating the given liquid with purified acetylene gas at atmospheric pressure and at a temperature of several degrees below —10 C, and measuring the gas evolved from this solution between the temperatures — 10 C and 20 C. The results may be tabulated as follows, the figures representing the volumes of gas evolved, per volume of solution, up to 20 C from a solution saturated at —10 C.

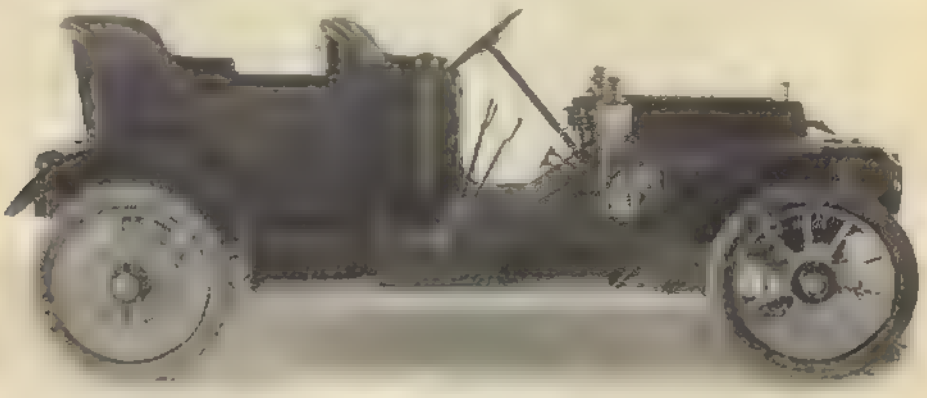
| | |
|---|---|
| Normal butyric aldehyde | 4.6 volumes |
| Acetyl acetone | 6 " |
| Methyl propyl ketone | 8.4 " |
| Acroelin | 15.0 " |
| Propionaldehyd | 18.5 " |
| Ethyl acetate | 20.4 " |
| Methyl acetate | 20.8 " |
| Acetone | 21.9 " |
| Acetaldehyde | 30.2 " |

From these results it will be seen that acetaldehyde has, for the purposes in view, the properties best suited for an acetylene solvent. It has the power to absorb at slightly lowered temperatures and to give off at atmospheric temperatures over 26 per cent. more acetylene than acetone, which has been the solvent used on a commercial scale up to the present time.

# The 1910 Mora Light Four

For the season of 1910 the Mora Motor Car Company, of Newark, N. Y., will market but one model of car, the Mora Light Four, of 35 H. P., 112-inch wheel base, 56 inch tread, selling at $2,500. Four different types of bodies are fitted to the same chassis, namely, the five-passenger touring, four-passenger close coupled roadster, four-passenger racytype, and a three-passenger surrey. In addition, closed limousine or landaulet bodies are fitted at the purchaser's option. The season of 1910 will mark the fifth year of its manufacture and in the pursuance of the one model policy the Mora Company makes for the refinement and perfection of a given car rather than of several types. The 1910 Light Four, which is a capable all-around car of intermediate weight and power reflects great care in production, with generous thought to detail and embodies refinements suggested here and there by an added season's experience. Aside from the substitution of a T type motor with valves on opposite sides, and the adoption of a perfected carburetor having a tempered glass float, there are no radical departures from previous Mora practice. The Mora under-pan has been redesigned and refined and various other original features of construction have been retained.

It is not the policy of the Mora Motor Car Company to build a great number of cars in any one season, but rather, to build a conservative number and have them "mechanically right" to borrow their own slogan. It is the contention of the manufacturers, that a car of intermediate power and weight best meets the demands of every-day all-around service suited to both cross-country work over all sorts of roads where careful production counts and in city and town work. The Mora Light Four impresses one as being mechanically fit and a vehicle that must, through superior merit, find a ready market in 1910. The output for next season will be 500 cars.



The Mora 1910 Light Four, 35 H. P., with [illegible] four different types of bodies. Price $2,500.

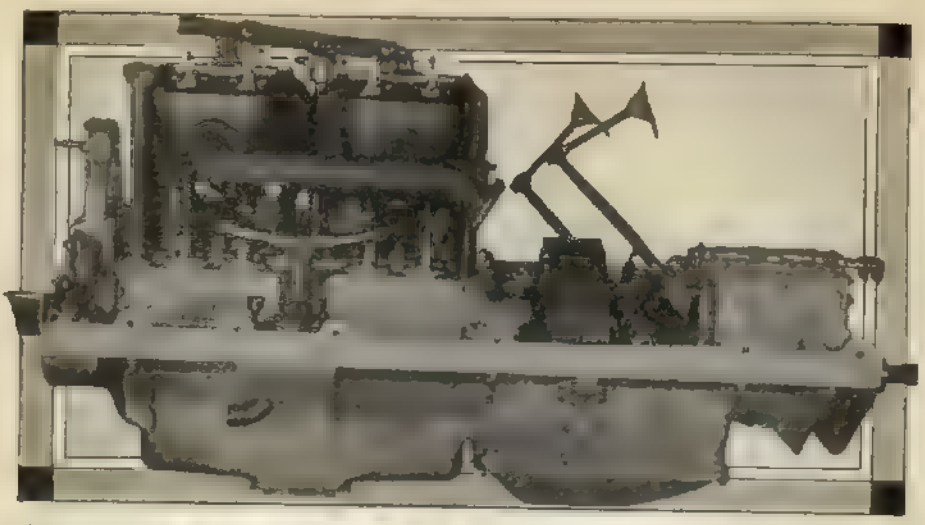


Fig. [illegible] View of the [illegible] and change speed gear following Mora practice. [illegible] case projecting the entire under side of the mechanism. The cylinders [illegible] the T type and increased in bore from 4 to 4¼ in., with a [illegible]

CHASSIS

The chassis of the Mora Light Four is of pressed steel construction dropped from the rear to admit of free clearance of the rear axle and cambered or inswept forward, allowing for a short turning radius. It is, in fact, sufficiently staunch to serve for a vehicle of much larger power plant, is braced transversely and in addition is stiffened by the engine base or under pan and protector which obviates any tendency towards disalignment. Twisting of the members is practically impossible.

MOTOR.

The only departure from previous Mora practice in any sense radical is the substitution of a T type for the L form of motor formerly used. The L motor always rendered satisfactory service, but with a view to increased power unit efficiency, Chief Engineer W. H. Birdsall has adopted the T type engine. One reason for the change is the increased size of valves permissible, to say nothing of a more evenly balanced unit. The 1910 motor is increased a half inch in bore, that is from 4 inches last season to 4½ this, with the same stroke of 5½ inches. The Mora Company favor the long stroke and substantiate their belief by using it. The

[illegible] of the front [illegible] of the 1910 Mora chassis [illegible] the [illegible] and [illegible] of the [illegible] position of the motor and magneto [illegible] A Pittsfield High Tension Magneto [illegible] is provided, each one controlled, of [illegible] a separate distributor [illegible] tion system is controlled by a separate switch and the

cylinder units are cast in pairs with integral water jackets of ample proportions, allowing for the free passage of water, the valves also being completely surround-

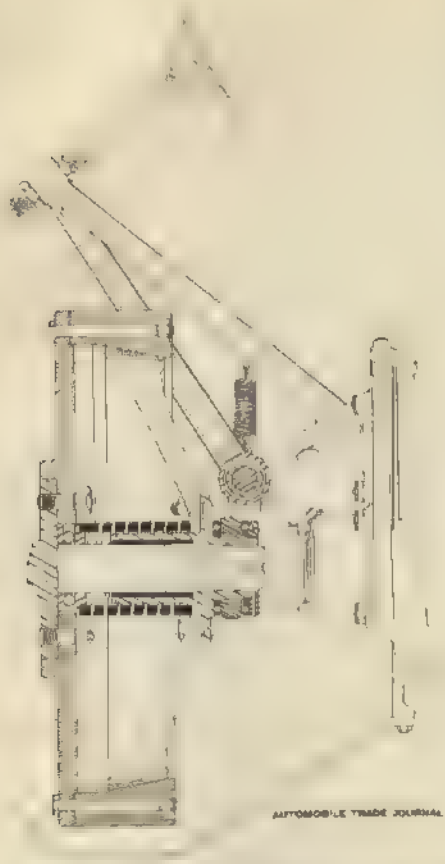



Fig. 4. Mora self-contained cone clutch. The engaging member of this clutch is of aluminum, faced with leather and the spring thrust is against the fly wheel [illegible] at the other side [illegible] to the steel [illegible] the clutch spring when the clutch is engaged

ed by water jackets. Brass core plates readily removable, at the tops of the cylinders, serve as outlets for the jackets and are held in place by 10¼ brass screws. To facilitate in machining the cylinders, the units are cast with holes in the domes of the compression chambers, which are closed up with brass plugs seated on copper gaskets. All Mora cylinders are now reamed and lapped in, the grinding process having been abandoned. The units are bolted to the upper half of the aluminum crank case by 6½-inch steel studs and nuts. The pistons are cast of special gray iron and accurately ground to size on a taper, that is to say, the dome of the piston is 10-1000 under cylinder size, the center 5-1000 and the base 2-1000 under cylinder dimensions. Each piston is provided with seven oil grooves, four eccentric rings being used. The wrist pin bearings are of bronze held in place by steel studs. The connecting rods are of the marine type, drop-forged L section, and provided with Parson's white bronze bearings liberally supplied with oil grooves and have a high heat resisting quality, though sufficiently fusible to melt before any damage could result to the crank bearings in case they went dry. All engine bearings are of similar material grooved for oil. Valves are of nickel steel with electrically welded carbon stems, two bronze guides to each stem, one for the stem proper and one for the plunger. The base of the plunger is mushroomed or flattened, no rollers being used, the base of the plunger engaging the cam direct. All valves are 1¾ inches in diameter, interchangeable, and have a lift of 5-16 inches. The cam shafts are of nickel steel, one inch in diameter, the cams being case-hardened, and both Woodruff keyed and pinned to the shafts, a double provision against their working loose. Midway between the valve stem and plunger is a fiber washer which tends to eliminate noise. Springs are of steel

THE CRANKSHAFT

is of 40-point carbon steel, drop-forged, with 1¾-inch wrists and 2-inch journals, their main bearings accurately ground to size. This feature of Mora construction is notable for the reason that a lighter shaft would doubtless serve all service demands, but, as a factor of safety, a stronger and heavier member is employed. Broken Mora shafts are claimed to be an unknown quantity.

THE INVERTED FLY-WHEEL CONE CLUTCH

is retained, it having proved very efficient in past models. The inverted female member is of cast iron and forms the rim of the fly wheel and is bolted to the radial or fly-wheel web secured to the crankshaft. The male member is of aluminum Both members are leather-faced. The outside diameter of the fly-wheel is 17¼ inches, the face being 4 inches. All liability to wear is obviated by making it self-contained as to thrust, so that, when the motor is pulling, the clutch is virtually an integral part of the fly-wheel. Liability to wear is restricted to the times when the clutch is disengaged which, of course, forms but a very small fraction of the time it is engaged. The wear is provided for by the use of an adjustable ball-bearing trunnion so that, when it is disengaged, the thrust is carried on ball bearings.

The timing gears, seven in number, are completely housed and immersed in oil, the timers being steel to cast iron and the fan gears built up of bronze and fibre.

COOLING

Ample cooling of the motor is assured by the use of large water jackets on the motor. The radiator is of the vertical spiral tube type. The centrifugal pump, located midway between the cylinder units, is gear-driven and takes in a supply from the bottom of the radiator, discharging to the jackets through a mani-

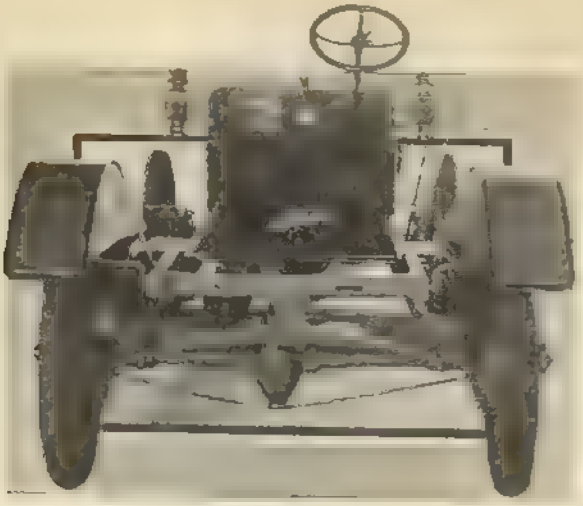


Fig 2. View of the rear of the Mora chassis which shows the rear cross spring construction and method of attachment to the frame. It also shows the large diameter brake the steel trussed rear axle, and the splash aprons attached to the rear mud guards. This rear axle is of semi floating type and mounted on roller bearings. The reduction on the direct drive is about three to one

fold connected to the cylinder jackets under the exhaust pipe, the water rising through the jackets passes out through the core plates and returns to the radiator.

A new type of aluminum fan, driven by fibre and bronze gears, has been fitted to the Light Four. The fan gear rotates on F. & S. ball bearings and the idler on a New Departure bearing. The fan, which is of one piece aluminum 14 inches in diameter and wire bound, is fitted with a friction clutch device and is always in communication through two leather-faced plates and a steel spring, the object of the clutch being to ease up on the fan when stopping or starting the motor. A feature of the radiator construction is that in the event of an accident to the tubes, the injured members may be plugged with wood and the efficiency of the member not greatly impaired, as happened to be the case with the Mora Sealed Bonnet World's Record Car

DUAL IGNITION

A dual system of ignition is provided, each complete and independent of the other. The primary source of current is from a Pittsfield high-tension magneto located on the inlet side, the plugs of which are located in brass screw plugs over the inlet valves in the path of the inrushing fresh gas. The secondary source or current is from a storage battery. A timer is located at the top of a vertical aluminum pillar between the cylinder units on the inlet side and is driven by two spiral gears off the half-time shaft, which is used with the battery set, the magneto having an individual distributor. Each system is controlled by a separate switch so that in case of trouble with the magneto there is still available the battery and coil. The Mora Motor Car Company conteud they were one of the first, if not the first concern, in this country to employ the dual system. The battery set can, of course, be well utilized in starting the motor.

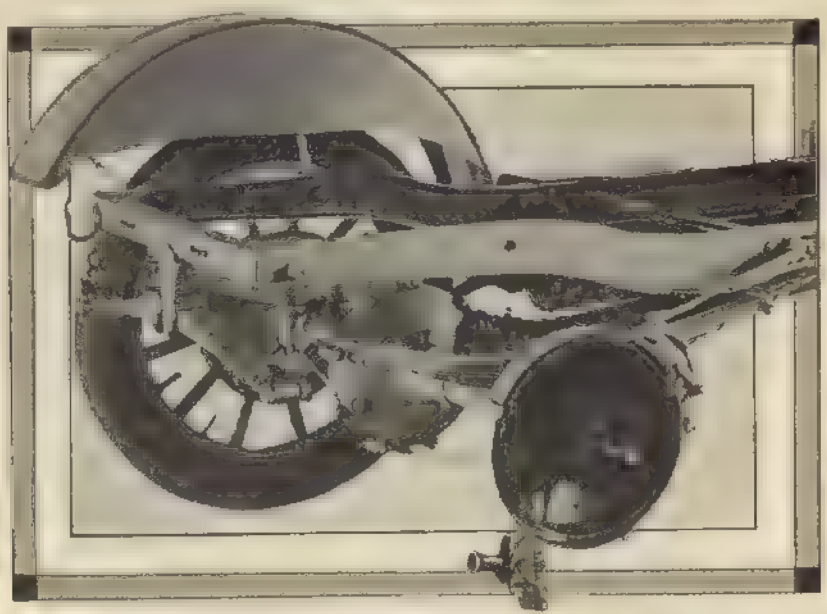
LUBRICATION

is by splash and force feed. The primary oil supply is carried in a false bottom cast integral with the aluminum under pan. A gear-driven pump actuated from the lower extremity of the timer shaft on the inlet side draws the supply from the oil reservoir in the false bottom, delivers it to a header or sight feed oiler attached to the exhaust manifold from whence it is delivered through ¼-inch copper pipes to the main bearings and the pistons. A unique device is fitted for controlling the splash level in the upper or crank pit section of the under pan. It consists of a copper stand-pipe and a thumb nut screw, both of which protrude to the upper reservoir. The oil level is thus controlled, so that, when the oil in the upper section reaches a higher level than the stand pipe it drains back through the pipe to the lower body. Stuffing boxes provided at the crank-shaft extremities obviate leaks, that at the fly-wheel end being novel. A rib or web integral with the crank-shaft allows the excess oil draining over it to pass through a groove back to the crank pits. The connecting rods and the pistons are constantly lubricated by splash. Two breathers with spreading conical funnels fitted with caps and strainers, permit easy renewal of the oil supply. All danger of dry bearings is eliminated. The sight feeds require no adjustment, their only purpose being to enable the operator to observe the proper delivery

THE MORA MUD PROOF UNDER PAN

The aluminum mud pan is retained,

though re-designed to meet the requirements of a larger motor. It is absolutely dust-proof and extends from the rear of the transmission case to the radiator, forming one complete unit for the lower half of the crank case, the base of the transmission and the housing of the timer gears. The upper and lower sections of the crank case form the complete timer gear case housing so that the usual opening between the engine gear case and the rear of the radiator is closed. The underpan is strongly trussed and webbed and the solid unit possesses the added advantage of stiffening the frame and ensuring constant alignment of motor and transmission. The engine base is bolted to the frame side members by 8½ steel bolts and the section to which the transmission case is secured is likewise bolted to the side members by 4½ inch steel bolts. The upper section of the crank case is aluminum and four large hand hole covers easily removed give access to all working elements



Rear end of Mora 1910 Chassis showing the 13⅝ in. dia. inside and 14 in. dia. outside brakes, each of which has the wide single-tree type equalizers are shown, their ends being guided in slots in the frame side members. The semi-elliptic set of springs are also shown these springs are well lipped and banded.

NEW CARBURETOR

The carburetor of the Mora Light four is an innovation, having a tempered glass float which permits the operator in case of trouble to observe the float without removal. The action is automatic and all springs in the auxiliary intake, as well as the usual poppet valve, have been eliminated. The throttle is located in the throat, having a butterfly valve or shutter actuated from the steering column or the foot accelerator. The air supply is governed by a strangle shutter in the lower body section and can be regulated as desired by the vertical rocker on the dash. The auxiliary supply is governed by fourteen ⅜-inch steel balls seated in holes or ports midway between the upper and lower sections of the carburetor body. As the car is speeded up, one ball after another leaves its seat, permitting the admission of a small quantity of air. This admission of small quantities of air all around the single spray nozzle insures complete mixture of air and gas is assured and an efficient fire obtained. As the throttle is partly closed, the balls reseat, thus reducing the volume of air, and, if the throttle is almost closed, the balls will reseat and all free air will be checked, allowing a richer mixture for slow speed work. A ball valve adjustment for regulating the level of the float and the nozzle spray is fitted. The vertical dash rocker working of a ratchet can be used to advantage in starting on the spark, if a rich mixture is left in the cylinders at the time of stopping. Feed is by gravity and pressure from the exhaust is recorded by a dash gauge. The tank is carried under the driver's seat. The cast aluminum intake manifold is secured to each unit by 3 5-16-inch steel studs through triangular glands. The carburetor being in proximity to the cylinders is sufficiently warmed for cold weather work

TRANSMISSION

The transmission is of the selective type, three speeds forward and reverse, direct drive on the high gear. All transmission gears are of 3½ per cent. nickel steel and of sufficiently strong construction for service in a much larger car than the Light Four. In fact, the 1910 Light Four transmission is identical, save for

There are refinements, with that used in the 42-50 H. P., six-cylinder Mora. The transmission forms one complete unit, instantly removable. It is secured to the aluminum under pan and bolted to the frame side members by four ½-inch steel bolts. All bearings are of the F. & S. annular type. It is absolutely impossible to engage more than one set of gears at the same time, owing to a neutral aligning block having a flat face and which is carried on the side lever tube which engages a corresponding member cast integral with the side lever shifting bracket. The gear shafts are all nickel steel. Stuffing boxes located at the shaft ends provide against oil leaks. All gears run in oil. The gear shifting shafts are carried on steel bearings and the gear shifting arms working the gear shifting shafts are secured to the bottom of the case. The speed change lever is of manganese bronze working in two parallel slots. Final drive is through propeller shaft carried in a steel tubular housing, which latter also serves as a strut rod, one end being bolted to the steel differential housing. The shaft of 1 13-16 diameter rotates on Hyatt roller bearings at the forward end. The universal joints of the Mora Light Four are practically the same as used last season. Another season of use has proven this feature of Mora construction to be sound. Two years ago the company conceived the idea of a square block shaft working in a square hole as being a simple and reliable construction. A few of these members were built and subjected to all sorts of abuse and, in a word, made good under adverse conditions. The construction, owing to the increased size and power of the motor, has been made heavier. Two of these members are used, one between the fly-wheel and the transmission and the other between the transmission and the propeller shaft.

AXLES

The front axle is drop-forged in one piece without a weld, with integral spring seats, and is of I beam section with a drop center. The rear axle is of the semi floating type bevel gear drive operating on roller bearings. The bevel gear and pinion are 4 D. P., 1⅝-inch face, nickel steel, heat treated, 15 teeth to the pinion and 42 to the bevel, affording about a 3 to 1 reduction. The bevel gear balance hubs are carried on ball bearings The rear axle is of 1 7-16 diameter, the wheels being keyed on to the outer extremities, which are tapered and further secured with hex. nuts. The bevel gear housing is of steel and in two sections. The tubes are brazed and pinned.

BRAKES.

There are two sets of brakes, operating on pressed steel drums on the rear wheels with an inside diameter of 13⅝ inches and outer of 14 inches, both of which are lined with a Scandinavian fibrous lining, and have a 2-inch face. The internal expanding band is worked by the emergency lever which also disengages the clutch. The right pedal actuates the external contracting band. Both brakes are applied through equalizers guided in slots in the frame side members and equal tension is assured regardless of individual brake band adjustment. The steel brake rods are compensating.

STEERING GEAR AND CONTROL.

The steering gear is irreversible, the steering action being a double gear reduction, a bevel pinion to a bevel sector carrying a spur pinion in an internal spur gear sector integral assembly with the globe end steering arm. The distance rod is carried ahead of the front axle. The drag link provides adjustment for wear. The spark and throttle levers are mounted on the top of the hand steering wheel, the pillar of which is conveniently raked. The foot pedals are of generous size, the left working the clutch and the right the foot brake. There are two hand side levers, an emergency brake lever of manganese bronze, latched, pushed forward first to disengage the clutch and then to apply the internal expanding brake.

An accelerator pedal is located midway between the foot pedals, which are adjustable to conform to the foot reach of the purchaser.

SPRINGS

The spring equipment of the Mora Light

Four is practically the same as last season. The front members are of semi-elliptic form, 38 inches long, 2 inches wide, with 8 graded and lipped leaves jointed to the frame forward and linked to side brackets at the rear, perched 17½ inches from the spring to the center of the front axle. The rear side springs of the three-quarter platform set are 48 inches long, 2 inches wide, and have 9 graded and lipped leaves, the three top leaves being banded, jointed to chassis frame brackets forward. No struts are fitted to the Mora Light Four with the possible exception of

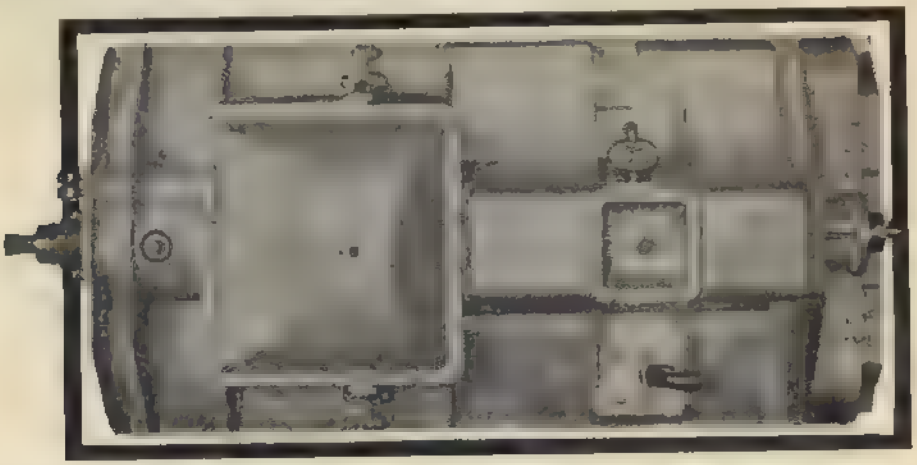


Fig 8. View of [illegible] side of the Mora Power Plant [illegible] This is a Mora feature [illegible] has been [illegible] gives [illegible] bearings of the three-point [illegible] Lastly, [illegible] set aluminum and greatly stiffens the frame

wheel and the lower portion of the transmission. It is [illegible]

the propeller shaft housing, the propulsion thrust of the driving wheels being transmitted to the frame through the spring ends themselves. The springs are on revolvable perches, perch centers 25 inches to the rear of the side spring front eyes. The cross or transverse member of the rear platform set is secured to the cross member of the chassis proper, which extends to the rear sufficiently for this purpose, also affording ample space for carrying a trunk. This cross member is 38 inches long, 2 inches wide, and has 7 graded and lipped leaves. The side and cross spring ends are connected with a cardinal joint cross with pins at right angles and links from the cross pin ends to the spring eye pin. This rear spring set permits of high speed over uneven roads with little, if any, ide sway.

The starting crank has an elongated horizontal section and is held in place by a V shaped brace, with a bearing at the center union. Relief cocks on the cylinders provide for compression release when necessary or for priming.

The muffler is of special ejector type and reduce is claimed to muffler pressure below atmosphere under ordinary conditions.

The wheels are of wood, artillery pattern, 12 spokes rear and 10 spokes forward. The front wheels revolve on ball bearings, that is to say, on cone and ball cup, with the bearing balls held in place by a steel retainer. A new type of hub cap has been fitted, readily removable with a spanner wrench.

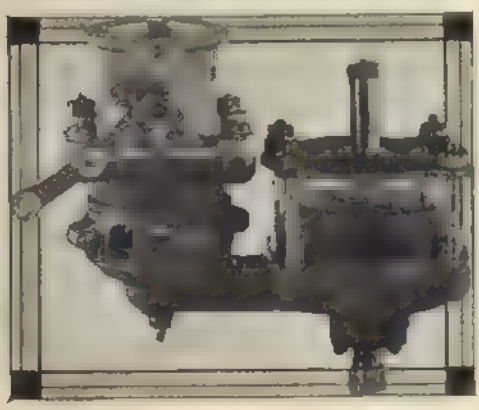


Fig 9. The new Mora Carburetor, with tempered glass [illegible] chamber which allows inspection of the float with [illegible] sticking and also permits seeing the gasoline [illegible] when the engine is running. A new type of auxiliary [illegible] with ball valve is provided. For details see [illegible]

BODIES

The bodies of the Mora Light Fours are of aluminum with rolled in panels. Fenders are of generous proportions

The Mora Light Four in actual demonstration proves to be a very flexible and easy riding car. The new carburetor affords a wide range of speed, and the T type motor performs in such a manner as to reflect credit on the designer and builders.

The dash is of mahogany, clear, save for the four unit Pittsfield coil, pressure gauge and the rich charge lever.

Floor boards and running boards are pyramid rubber covered, brass bound, running-board brackets being of pressed steel. The fender irons are of hand-forged iron.

The accompanying photograph shows the 1910 Stevens-Duryea Models. In the upper left hand corner is the model XXX which is a 4-cylinder car at $2,850 flat with all cover $100 extra. In the upper right hand corner is the XXX Baby roadster which has practically the same chassis arrangements as the previous model. In the lower left hand corner is shown the 1910 Model Y 6-cylinder car which sells for $4000. In the lower right hand corner is the 4-cylinder touring car Model X.

# 1910 Stevens-Duryea Models

The designing and marketing of six cylinder cars in 1905 was an epoch in the motor car history of the Stevens-Duryea Co., Chicopee Falls, Mass.

The policy of the company at that early date was the advancing of the six cylinder motor for their larger cars. Its success was instantaneous and their argument has been adhered to strictly since its inception, that all motors of over 30 H. P. should be of the six cylinder type.

In 1904 an advance thought was incorporated in the power plant design of their X body of which has been refined and a slight change made in the guard over the rear wheels, the change in the chassis being the addition of a torsion rod to the rear axle.

It also has the platform spring type of rear suspension, chassis having a wheel base of 124 inches, 34x4 in. tires for front and rear wheels.

Enclosed bodies are also fitted to the Model "Y" and "X" and the chassis allows for the interchanging of the touring body for a limousine or landaulette.

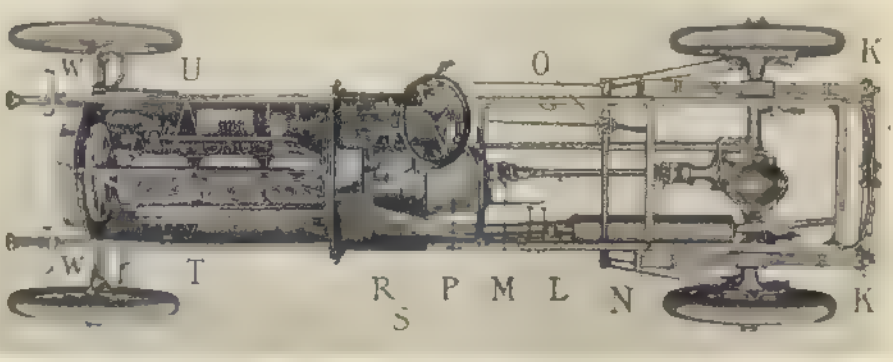



Fig. 1. Plan view of the 1910 Model Y 6 cylinder chassis showing the motor location, clutch and change speed gear, these forming a unit mounted on three points also the universal joints M and N and the rear axle construction. Platform springs are used at the rear and a special connecting shackle K which is designed particularly to overcome the side roll of the bodies of the large cars when rounding curves at speed, is used. This chassis has 142 inch wheel base. The front tires are 36x4 and the rear tires 36x5

four cylinder cars. The original production, although a radical departure from conventional lines, has withstood all the time tried tests covering a period of five years, and each succeeding year's announcement has found the motor crank case, the multiple disc clutch, and the sliding gear transmission embodied as a unit power plant on three points of suspension, drive to the rear wheels being of the shaft type.

The production for 1910 retains the distinctive features synonymous with the name of Stevens-Duryea from 1904 and comprises a line of four and six cylinder cars from twenty-four to forty H. P.

MODEL "Y" 1910 SIX CYLINDER TOURING CAR

The Model Y six cylinder 40 H. P. with motor of 4¾ bore 4½ in. stroke, has as standard equipment an extremely roomy 7 passenger body as shown in the photograph. This model has platform spring suspension at the rear, a chassis of one hundred and forty two inch wheel base, and tires of 36x5 rear and 36x4 front.

MODEL "X" 1910 FOUR CYLINDER TOURING CAR

The Model X four cylinder 24 H. P. with motor 4¾ bore 4½ in. stroke is designed as a touring car seating five, the Model

MODEL "XXX" FOUR CYLINDER RUNABOUT AND BABY TONNEAU

The Model XXX of 24 H. P. having the same four cylinder motor 4¾ bore 4½ stroke as the Model "X" Touring Car is designed for a runabout with single bucket seat of baby tonneau bodies.

The rear seats of the baby tonneau are easily detached but not interchangeable with that of the runabout. The wheel base is 109 inches with semi elliptic springs 56 inches long at the rear, 36 inches long at the front, tires 36x4 in. rear and 36x3½ in. front for the runabout, 36x4 in. rear and front for the baby tonneau

SPRING SUSPENSION

In Fig. 1 is shown a full top view of the chassis of the 1910 Model "Y" six cylinder. Platform spring suspension is used at the rear and has connecting shackles "K" designed to overcome the side roll on curves of the large and fast cars. Both front and rear spring clips are of special design which allows the springs to be made without the usual binding bolt in the center. The discarding of the bolt greatly strengthens the entire spring as the bolt hole was drilled in the spring

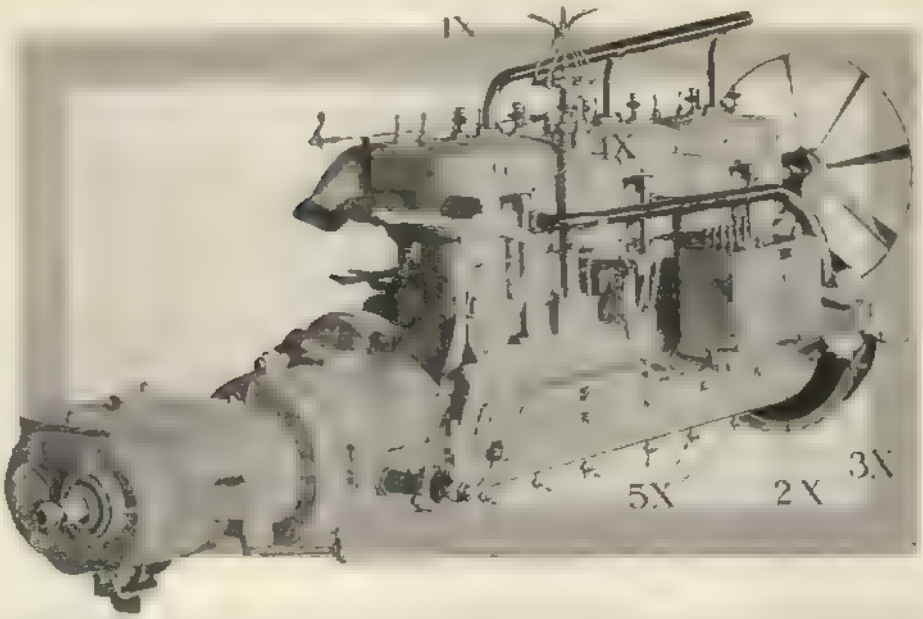



Fig. 2. Side of unit power plant of the 6-cylinder Model Y, Stevens-Duryea, showing the unit power plant flexibly mounted at a single point at the rear and two points at the front. This view shows the arrangement of the timer on its vertical shaft in an accessible position; also the oiler with its neatly arranged leads; the centrifugal 3X pump is also shown at the forward end, and beneath the crank case are shown the drain cocks 5X, each of which has an inside stand pipe of the proper height so that opening it drains off any excess of oil and gives the correct level for splash lubrication.

leaves at their weakest point. The forward ends of the rear side springs are attached by offset forgings directly to the chassis frame, maintaining a perfect alignment of the front and rear axles.

The propeller shaft "L" has two universal joints "M" & "N," the forward one "M" having a square stationary connection to the transmission shaft and its rear end has a long square hole into which slides the forward end of the drive shaft. This construction allows the drive shaft to rotate without communicating any end thrust to the power plant or rear axle. The rear universal joint "N" is attached to the drive and pinion shaft by two square connections. A ball and socket compensator "O" equalizes the braking strain of the contracting foot brakes at the rear wheel.

ACCESSIBILITY OF PARTS.

The transmission can be readily inspected or removed by unscrewing three thumb nuts and taking off the cover "P" without the removal of the body or the gasoline tank. Inspection cover "R" or clutch

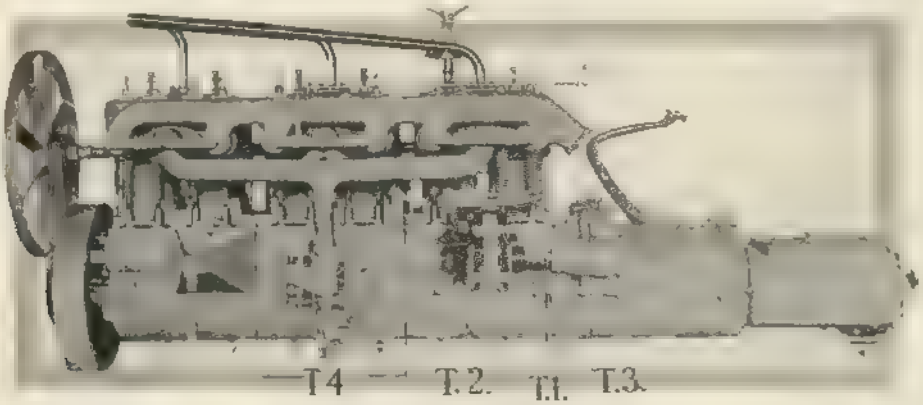



Fig. Carburetor and magneto side of unit power plant 1910 Model Y 6-cylinder Stevens-Duryea. This carburetor and manifold complete can be taken off without disturbing the exhaust manifold. This shows the mounting of the magneto which is driven by a gear in the clutch case through a small universal coupling T1, which relieves the armature of any unnecessary strains. This location of the magneto well to the rear also protects it from dirt or mud coming through the radiator. It is held by a single binding strap T2 so that it can be instantly removed. The studs T4 bear against the upper half of the two center cam shaft bearings so that they can be readily adjusted from the outside.

cover "S" can be taken off by removing foot boards. The accessibility of the transmission and clutch as well as each part used in the construction of the (unit) power plant make possible not only quick daily inspection, but allow a thorough overhauling without the usual delay and expense.

Tie rod "T" from right to left front wheel together with steering yoke "U" are located at the rear and above the front axle in a protected position. Incorporated in the construction of the steering knuckle arms, are two adjustable stops "W" which prevent the front tires from coming in contact with the chassis frame and also overcome the possibility of front wheels becoming locked when turned to the extreme in either direction

The steel used in the springs of all Stevens-Duryea cars it is claimed has been selected after thoroughly and exhaustively testing American and imported steels and that it has been conclusively proven that the elastic limit and limit of compression of this steel makes possible the design of a spring allowing a greater travel of axle than usual

THE UNIT POWER PLANT

The power plant as in previous models is of unit construction and mounted on its two stationary and one rocking support is not affected in any way by the distortion of the chassis frame caused by uneven roads or driving conditions. This mode of construction renders it under any conditions impossible to strain the motor case, or cause any but a rotating friction on the bearings. The forward bearing of engine and the bearing at the rear in the transmission are always in perfect alignment due to the three point support which allows the entire motor to roll without any strain on the case

A time saving feature, the result of careful attention to details, is the possibility of removing the pistons without taking off the cylinders by simply removing the lower half of the crank case, taking off the cap on the connecting rod. The taking out of piston without the breaking of water connections, disturbing adjustments, or the removal of cylinders, adds another distinctive feature. The pistons and connecting rods weigh the same for each cylinder, giving perfect balance.

This power plant of the 6 cylinder Model Y is shown in Fig. 2.

The six cylinder crank shaft forged from "special" nickel steel has all bearings accurately ground and extreme care is exercised to perfectly balance each shaft. It is supported by four ample size bearings from the upper half of the crank case which permits the removal of the lower half of case without disturbing any of the bearing adjustments.

Fig. 1. Side view of Stevens Duryea Model Y chassis. A is a cam lever to the apron V which extends under the entire mechanism and is held by spring connections as at ... all ... ng ... its ready removal. At J is located a muffler cut out valve. A 22-gallon gasoline tank is located at A under the front seats and supplies carburetor by gravity. This tank contains an auxiliary compartment holding three gallons. The wheel base is 142 inches.

The six contact timer No. "1X" is operated from the lay shaft by bevel gears as is also the oiler No. "2X" and centrifugal pump No. "3X."

Breather pipes No. "4X," three in number, allow for quickly filling the crank base, each supplying oil to the respective cylinders beside which they are located.

LUBRICATION

The mechanical oiler No. "2X" forces oil under pressure direct to the crank shaft bearings. The supplying of new fresh oil to the main bearings has been found to be the most economical in regard to quantity used, as well as preventing excessive wear on the motor bearings

Oil from the main bearings, supplies the lower half of the crank case for splash, which is used to lubricate all pistons, connecting rod bearings, and rotating parts directly below the cylinders. The six petcocks No. "5X" have stand pipes extending above the lowest point in the base to a predetermined height, and on being opened, drain off any excess of oil in the splash system.

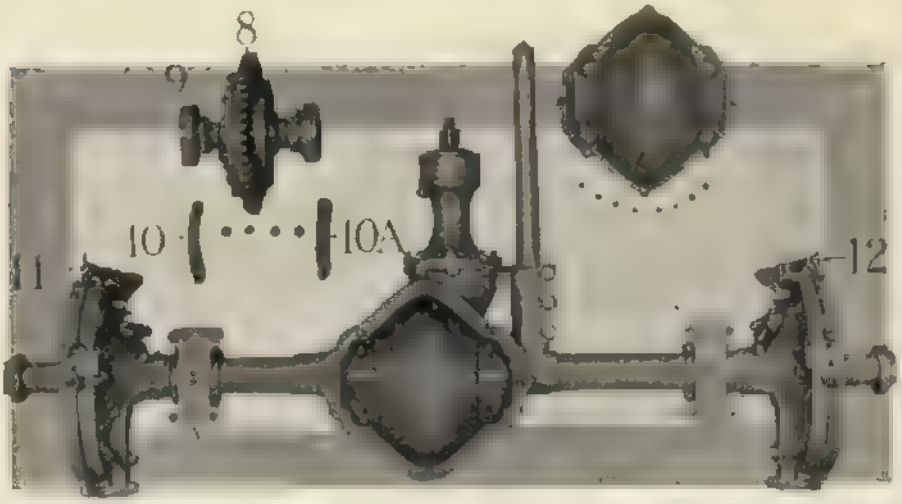



Fig. 5. Rear axle construction of Model Y 6-cylinder Stevens-Duryea. This axle is of the full floating type. The differential A rotates on a [illegible] bearings arranged [illegible] both radial and thrust loads. The rear wheels revolve on the stationary housing and are fitted with annular ball bearings at both ends of the hubs. The [illegible] nuts 11 and 12 provide a quick and positive adjustment of the brakes, and automatically lock on each half [illegible]. The spring seats are mounted on lubricated [illegible] of strap type surrounding the rear axle housing [illegible] springs of all [illegible] strains.

The fan is attached to the motor base by a forged arm and rotates on ball bearings, the tension on the endless belt is at all times maintained equal, by spring pressure on the supporting arm.

Each pair of cylinders are ground on special machines, connected with a water cooling system on the grinder so that by forcing water through the jackets as the cylinder is ground, it is possible to have the grinding wheels rotate at their maximum speed, without any danger of overheating the cylinder walls or causing distortion as they cool.

Valves, tappets and carburetor location have been given careful attention so as to make each readily adjustable without the removal of other parts of the motor. The complete carburetor and its manifold can be taken off without removing the exhaust pipe.

The cam shaft is operated by gears enclosed in the clutch case "T3." Fig. 3, the face of the gear being fibre insures its quiet running without lubrication

Studs "T4" contact with the upper half of the two center cam shaft bearings, making possible an adjustment to these bearings without removing any part of the motor

HIGH TENSION MAGNETO

The magneto is directly connected to a gear in the clutch case by a small universal coupling "T1" which relieves all strain on the armature shaft and the position of the magneto well to the rear of the motor prevents the water or mud that is drawn through openings in the radiator from short circuiting the magneto. The releasing of one binding screw allows holding straps "T2" to be separated and the magneto can be removed from the base. In replacing, all that is necessary to insure that the shaft is in alignment, is to insert the small locating pins in the base before tightening the holding strap.

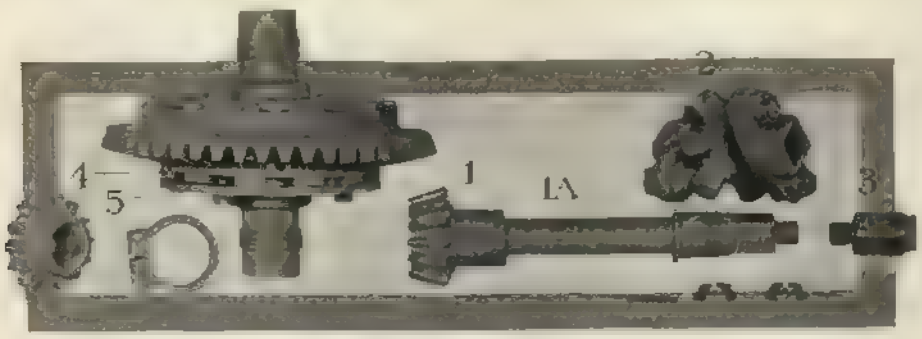



Fig. 6. Details of the differential bevel gear and pinion and universal joint of the Model Y. Bevel pinion 1 is forged integral with its shaft 1A. the universal joint 2 is clearly shown and is attached to the shafts by the square ends and locked by the castle nuts shown. The cover plate 5 of the differential is shown partly removed. It will be noticed it is dove-tailed into the differential housing 4.

DRY MULTIPLE DISC CLUTCH

The clutch is of the multiple disc type running without oil, the same as all Stevens-Duryea Company's cars have been equipped with, since 1904. The standardization of this type of clutch six years ago, was due to its light weight, simplicity combined with its positive release when operated and ability to withstand excessive abuse. The driving discs faced with an indestructible material composed of woven wire and asbestos are placed alternately with driven discs of steel, the driving and driven discs being held together by spring pressure, all rotating together when the clutch is engaged. A forward movement of the clutch pedal relieves the pressure on the discs and allows the driving member to rotate without driving the clutch member. The clutch and transmission being enclosed in the same case, make possible the connection of one with the other by a square clamp—this construction overcomes the necessity of uniting the clutch and transmission with a universal joint requiring lubrication.

THE CHANGE GEARS

The sliding gear transmission has three speeds forward and one reverse, the gears being cut from chrome nickel steel. The sliding gear has internal teeth and meshes with the drive gear giving a direct drive on third or high speed.

The main driving square shaft and countershaft rotate on annular ball bearings and the entire transmission is lubricated by the splash system. The universal joint is attached to the end of the transmission shaft by a square connection and the rear end of the joint has a long square hole into which slides the forward end of the drive shaft. Lubrication is supplied by a grease cup.

The chassis frame is of simple design, having straight side members of chrome nickel steel, the only offset being in a vertical plane over the rear axle. All spring shackles and connections are drop forged with ample provision made for oiling. The rear support for the platform spring is also drop forged and the attachment of this support to the outer rear ends of the chassis greatly strengthens the frame. The four cross frames are pressed from chrome nickel steel and are riveted to the side member under hydraulic pressure.

In Fig. 4 is shown a side view of the 6-cylinder chassis of Model Y.

The gasoline tank "A" of 22 gallons having an auxiliary supply of 3 gallon capacity is located under the front seat, supplying by gravity feed to the carburetor.

The apron "B" is easily detached by spring connections "C," and is carried well to the rear fully protecting the under side of the complete power plant.

Fig. 1. Plan view of Model Y [illegible] showing the seating arrangement. Notice the folding auxiliary seats giving the car a seating capacity of [illegible]

The location of centrifugal pump "D," mechanical oiler "E," steering post "G," as well as vertical six contact timer, gives each an accessibility as an individual unit for adjustment without the removing of any other part of the motor.

COOLING SYSTEM

The circulation is by centrifugal pump. Two threaded unions "H" connect the upper and lower water pipes with the radiator, and allows it to be easily and quickly removed. For 1910, the centrifugal pump, taper brass piping, short easily detached flexible connections to the radiator, ample radiator surface combined with a fan having an automatic tightening device for the belt, are retained without change.

REAR AXLE ASSEMBLY

The full floating type of rear axle construction for the 1910 model embodies a number of exclusive features, noticeably the forging of pinion gear No. 1, Fig. 6, integral with shaft No. 1A, the attaching of universal joint No. 2 to ends of shaft, No. 1A and 3 with square connections, and the dove-tailing of the differential case No. 4 with covers No. 5

The internal gears are broached with a square hole into which inner ends of right "R" left "L" floating axle shafts are inserted, all gears being cut from "special" nickel gear steel.

The outer ends of the shafts are also squared on which are pinned and dovetailed flanges.

Extreme care has been given to the design and construction of the entire drive line from fly wheel to rear hub by the substitution for the conventional round tapers and keys a series of square and taper squares at the connecting points.

The square connections and the forgings of pinion on the gear with its shaft insures not only all units in the power line being positively connected, but if at any time the removal of a section is required, it can be easily and quickly accomplished and replaced with certainty of its running perfectly true.

The differential No. 8 rotates as a unit on special ball bearings constructed with cone and cup to carry with equal efficiency both radial and thrust loads. The adjustment to the bearings and the meshing of the larger bevel gear with the pinion gear only require the turning of lock collars No. 9 and 9A on the differential case. The removal of clamp No. 10 and 10A and the withdrawing of axles right R and left L, allow the differential housing and bevel gear to be withdrawn as a unit

The rear wheels revolve on the stationary axle housing and are equipped with annular ball bearings at both outer and inner ends of the hub. Annular ball bearings, two in number, are also used on the pinion shaft, the inner one is located near the pinion gear and the outer one on the extreme end of the shaft. This design relieves all the angular strain from the shaft and pinion gear.

A quick and positive adjustment of the rear foot brakes can be made by simply turning the wing nuts No. 11 and 12. On each half turn, they automatically lock in slots on the upper half of the brake shoe.

The torsion rod is of tubular construction, tapered at its outer end and supported by a ball and socket spring connection to the cross frame at the rear of the unit power plant.

The spring seats turn in lubricated bearings or sleeves attached to the axle housings relieving all torsional stresses from the springs. The sleeves are adjustable to location on the housing, making it possible for each chassis to be accurately assembled in regards to the alignment of the rear bearing in the transmission with the forward bearing on the pinion shaft of the rear axle.

CONTROL.

The gear shift and the emergency brake levers are attached to the chassis frame, and located as usual.

The changing of gears is accomplished by releasing the clutch and a forward or reverse motion of the gear shifting handle. A self-finding quadrant insures the gears being positively meshed, allowing for a rapid and extremely quiet gear exchange.

The application of the internal expanding rear brakes is by a forward movement of the emergency brake handle. The brake rods are directly connected at their ends with the levers without the use of wires or slip connections.

The steering post has on its upper end a stationary quadrant on which is operated the spark advance lever. The throttle control lever is placed on the under side of the quadrant and works in connection with a foot accelerator in the floor at the operator's seat.

A worm gear forged integral with the shaft of the steering post meshes with a sector which is attached to the steering arm by a taper square connection. A hardened eccentric bushing allows accurate adjustment

Spring cushions on the ends of the rod from the steering post to the front axle tie rod, relieves the excessive strain from the entire steering construction.

## AUTO PARTS CO. ORGANIZED

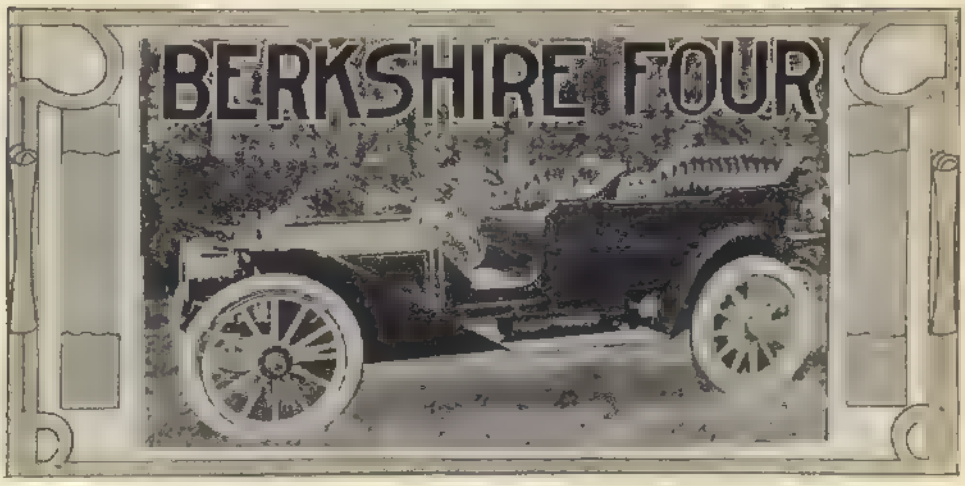
L. A. Austin, formerly assistant manager of the Northern Automobile Company and latterly in charge of the Northern parts department of the E-M-F Company—which concern absorbed the Northern and Wayne Companies—has, in company with A. O. Dunk organized the Auto Parts Company, with offices and machine shop at St Antoine and the Michigan Central Railway crossing, Detroit, Mich.

The Auto Parts Company has purchased from the E-M-F Company all parts, drawings, patterns, jigs and special tools for making replacement parts for Northern and Wayne cars of all models. This arrangement was entered into because it was thought that a concern devoting its entire attention to that business could give Wayne and Northern car owners more efficient service than the big manufacturing concern, of which this was only one of many departments

## THE EMPIRE CAR

The plant of the Mohawk Cycle Works at Indianapolis, Ind., is now in the hands of R. H. Hassler, who has designed an entirely new car known as the Empire, 1000 of which, it is said, will be placed on the market for 1910. This runabout will sell for $800 as a 4-cylinder motor of 3½ by 4 cast "en bloc" and will be fitted with 32 by 3½-inch tires.

The 1910 Apperson line will be very similar to that of 1909, but in addition this company is bringing out an entirely new model, a five-passenger touring car, which it is said will sell at a considerably lower price than any Apperson car heretofore placed on the market.




BY C. R. MORRIS.

Of rather attractive design is the 1910 35 H. P. four cylinder water cooled Berkshire, made and tested in the Berkshire Hills, and, at the price, it is one of the most capable cars in its class. Obviously a car built among the Berkshires must needs be an able hill climber, must have an abundance of power in reserve and all this marks this snappy car built by the Berkshire Auto-Car Company, of Pittsfield, Mass. Many novel features of construction are found in its design and of these the flat seat valve is noteworthy. This feature of construction tried out on other cars of domestic origin and discarded because of alleged inefficiency is in the 1910 Berkshire developed to the highest limit of efficiency, in fact, all previous Berkshire models have employed the flat faced valve and because of the satisfactory results attained in the past it is retained and perpetuated in the 1910 production. The standard 35 H. P. four cylinder Berkshire car sells for $2,900 and all other models, save for a shorter wheel base, as, in the case of the toy tonneau and runabout types, employ the same running gear and power plant. The 1910 Berkshire is the design of chief engineer E. B. Belcher and in his latest effort are reflected generous thought to detail, refinement of design and obtaining the highest efficiency for the material used and at the price at which the car sells. In fact, it may be said with due regard for the truth that in this the 1910 Berkshire are features of construction which one could not really expect in a car selling in its price class. The up-to-date multiple disk clutch is used, and on this particular car under the most strenuous of tests it has proven eminently satisfactory.

MOTOR

The motor of the 1910 Berkshire Four, is of the well-known T type and is of neat design, the valves of course being placed on each side of the cylinders and actuated by two cam shafts. The water jackets are cast integral and completely surround the valve chambers, each cylinder being anchored to the aluminum crank case by ⅝-inch steel studs. By the employment of the single cast cylinders, a five bearing crankshaft with liberal bearings is possible. All cylinders of Berkshire models are

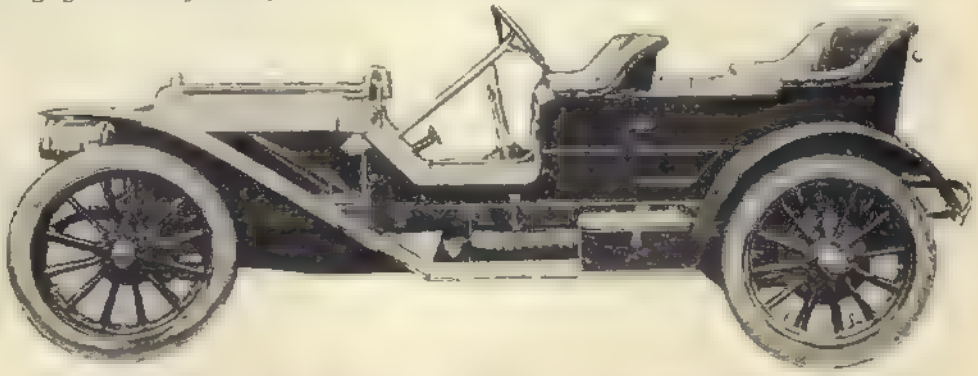


Fig. 1. Berkshire 1910 4-cylinder Forty Tonneau. Alloys of bodies and [illegible] cylinder motor [illegible] 5½ in., 35 H. P. Valves on the side with two cam shafts. Dual ignition [illegible] ing change speed gears, full floating rear axles. For details see text.

bored, reamed and lapped to gauge ensuring a perfect wall surface and free from all foreign material incident to the use of other processes of finishing. All valves are of special alloy nickel steel, flat faced, ensuring a complete scavenging of the spent gases and the prompt admission of the fresh charges. All valves are interchangeable and are 2¼ inches in diameter, springs are of steel. The cylinder bore is 4 11-16 inches, stroke 5½ inches, engineer Belcher being an advocate of the

Fig. 2. Front view of 1910 Berkshire, showing fender supports and lamp brackets, also the milled out I-beam drop centered axle and reversed Elliott steering knuckles.

long stroke motor, and firmly convinced of its added advantages. In actual service the long stroke has proven most efficient. There is a lift of 7-16 inches on the exhaust valves and ⅜ inches on the inlet. Provision is made for adjustment on the vertical push rods. The cam shafts are of special alloy steel, cams being integral and for bearings plastic bronze is used. The valve rollers are housed in bronze guides which are bolted to the crank case, the rollers and lifters being of hardened and ground steel. The pistons are of selected cast gray iron fitted with four eccentric ground rings diagonal lapped, all carried above the wrist pin. There are four oil grooves. The wrist pin is of hardened and ground alloy steel. The connecting rods being of drop forged nickel steel I-section, the wrist pin connection being solid, grooved for oil and the pin itself is bushed with bronze bosses and retained in place by two ⅜-inch steel set screws which prevent sidewise motion, or turning. The crankshaft having five liberal bearings is an anvil forging of special alloy steel and of expensive construction, that is, the hogged out or sawed out type. It is 1¾ inches in diameter, the rear bearing being four inches long, while the others are two inches long.

The motor bearings throughout are of Parsons white brass and are retained in the bronze blocks by novel means. The blocks themselves are of the so-called dove tailed construction, so that, when the metal is poured and hammered into the block it becomes firmly anchored and cannot be displaced under any load strain. All motor bearings are retained in the upper crank case section, the intermediate members being held in place by two steel studs while the front and rear members are retained by four studs. The upper crank case section forms one-half of the timing gear housing, the other half of course, being a separate member. Timing gears are of steel and bronze, lubrication being by splash. While the upper section of the crank case retains the motor bearings, the lower half is used primarily for the oil supply, the upper section having the supporting arms cast integral.

OILING SYSTEM

The oiling system of the 1910 Berkshire is novel and positive. The oil carried in the lower crank case section is lifted by a gear pump located at the lowest section of the oil reservoir and removable through the case without disassembling the case, the supply being strained through a 120-mesh brass screen, so that the pump circulates clean oil only. The oil is raised to the sight feed on the dash and thence passes through a brass leader ⅜ diameter having 5 copper leads to the main bearings. The pump is actuated by a gear off the cam shaft. The faces of the crank pins and the faces of the crank webs are drilled with ¼ inch holes so that they is a circulation through these drilled leads to the bearings. Each of the five copper leads from the main supply carried through the ⅜ brass pipe discharge into the center of the bearing blocks and through the white brass bearings to the face of the crank bearings, so that, there is a continuous flow of lubricant to the pins at all times. So efficient is this system of force feed lubrication that it is really unnecessary to carry an excessive quantity of oil in the crank pits. On the contrary one need not avail himself of the splash lubrication unless he so desires. An additional amount of oil in the lower crank case section poured through the breather of course assures a dip bath for the crank pins and the connecting rods, this, however, is not necessary to the efficient working of the motor. There is an oil ring at each end of the crank shaft which obviates oil leaks along the shaft

IGNITION DETAILS

Ignition is double, that is there is a storage battery and a Bosch magneto which is furnished as regular equipment, as the source of current. The dash of the Berkshire is comparatively free carrying only the sight feed oiler, the Bosch single unit coil and self starter, the latter being furnished as part of the regular equipment. The Bosch coil is of the non-vibrating single unit type. The plugs are located on the left side of the motor directly over the inlet valves and so placed that the flame or spark is shot across the combustion

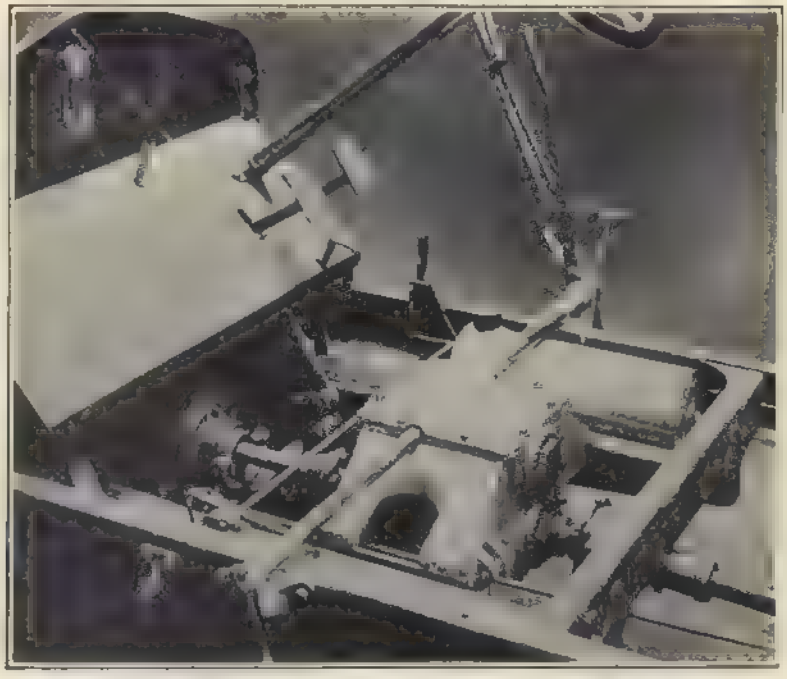


Fig. 2. Control details of 1910 Berkshire Four. Transmission is supported at four points on the sub-frame, multiple disc clutch housing, muffler cut out lever with locking latch, foot pedals and accelerator, clutch yoke and shaft driving gear between the clutch and transmission case, gear shifting lever worked from underneath the transmission case, gasoline supply tank, oil tank holds two gallons, note support at rear and hangers of the motor and transmission case, also front wheel is made of pressed steel bolt rivets.

chamber. The high tension magneto is driven off the cam shaft through a universal joint on the left side of the motor, and is fitted with its own distributor, there being four short cable leads to the respective plugs, one set serving for the battery system. The ignition cable lead secured to the heads of the cylinders is of fibre construction.

The inlet side of the motor is the right, the exhaust being on the left. The inlet manifold is of neat design of aluminum 1½ inches inside diameter, the carburetor being of the automatic type and water jacketed, the water for jacket circulation being forced by the water pump on the left and discharged into the jacket of the number 2 cylinder on the right. A feature of the regular equipment is the muffler cut out which may be locked in the cut out position and which provides a direct downward discharge of the gas, being actuated by a pedal. The exhaust manifold is of cast iron, the lead to the muffler being steel tubing two inches in diameter. Cooling is of course by water the centrifugal pump being located on the left side of the motor and driven from the cam shaft. A brass idler serves as the pulley drive for the fan. All water piping is of copper, the pump supply being drawn from the bottom of the radiator and lifted through the water manifold to the base of the cylinder jackets on the left side of the motor and passing outward through the heads of the jackets and back to the radiator.

Fig. 3. Multiple disc clutch partially disassembled. The flywheel, not shown, which is built up of 36 hardened and ground saw blades or discs, each alternate disc being provided with an integral spring which separates the discs when the clutch is disengaged. The case is of bronze and bolted to the fly wheel of the motor. Thrust is taken up by a Hess-Bright ball thrust between the fly wheel and the clutch. Clutch works in an oil bath and is remarkably smooth and tractious in action.

THE MULTIPLE DISC CLUTCH

The motor fly wheel is of cast iron 18 inches in diameter and has a four and one half inch face. The multiple disc clutch is contained within a bronze case bolted to the motor fly wheel and is composed of 36 hardened and ground saw steel discs alternate discs being provided with integral springs which separate the discs when the clutch is disengaged, the plates

working in an oil bath. Smooth engagement under all conditions is a feature of the clutch which was especially noticeable during the course of a demonstration of the car. All end thrust is taken up by a Hess-Bright ball thrust located between the clutch and fly wheel.

The clutch yoke is of drop forged steel, simple in construction and effective in operation. Final drive is through a nickel steel propeller shaft fitted with two universal joints, the shaft being 1⅝ inches in diameter. The connection between the clutch and the transmission is a short nickel steel shaft with squared ends.

THE TRANSMISSION AND GEAR RATIOS

The transmission is of the selective type having three forward speeds and reverse with direct drive on the high gear. Cars are geared in accordance with the use that is to be made of them, for instance, the standard touring models are geared 3 or 3½ to 1 the same gearing being ample for the limousine types, while the pony tonneau and runabout models are geared 2½ to 1, on which gear hills may be made without undue exertion on the motor, as was conclusively proven in the course of a demonstration over Lebanon mountain with three people in the car, the grade being about three miles long. Also with this gearing there is possible a wide range of speed to meet all demands and the car may be operated sufficiently slow on the high gear for city work. The transmission gears are of chrome nickel steel hardened and ground, bearings being of the Timken roller type and shafts are of chrome nickel steel. The gear shifting lever is carried close to the top of gear case cover. An interlocking device on the gear shafts prevents more than one combination being worked at the same time.

REAR AXLE

The rear axle is of the full floating type, the weight of the car being supported by the axle housings or tubes. The driving shafts are squared at the inner extremities where they enter the differential case while the outer extremities are fitted with six jaw clutches engaging corresponding members on the wheel hubs, so that the drive is through the hubs. The differential case is of pressed steel and being in itself a truss no truss rod is required. The gears are of chrome nickel steel and the driving shafts of nickel steel 1⅝ in diameter, bearings being Timken roller. The differential gears may be removed without disturbing the adjustment by unbolting the face plate of the housing.

A V-shaped torsion tube is fitted, being formed by heavy gauge steel tubing and provided forward with a spring buffer, anchored to a cross member of the frame, the rear end being anchored to the differential housing.

THE BRAKES

There is ample provision for breakage, either set being sufficiently powerful to check the car with ease. Both sets work on the pressed steel drums bolted to the rear wheels. One set of brakes work on the outer faces of the drums and the other set on the inner faces. The drums are 14 inches in diameter by 2½ inch face, lined with thermoid asbestos. Steel cables are used, cables being self-adjusting, and provision is made for adjustment of brake bands by a thumb screw and lever spring device. The foot brake actuates the external contracting bands and the hand side lever the internal expanding shoes. The brake bars are provided with distance rods. Not only is the positive alignment of the rear construction assured by the staunch torsion tube but also by side turnbuckle adjusted strut rods of drop forged I-section steel construction.

The side members of the chassis are inswept forward to give a short turning radius and are upswept at the rear. The frame is of pressed steel hot riveted being strongly cross braced and the cross members are provided with integral gusset plates. The side members are of deep channel section. The motor and transmission are carried on a pressed steel subframe of strong construction which is an-

Fig. 5. ... engine group showing piston of cast gray iron, steel connecting rod, valve roller and bronze guide, ... seated ... steel valve, bronze bearing box with Parsons white brass bearing held in place by a dove tail arrangement. The Berkshire crank shaft shown, is of the five bearing type, the pin ... ng two inches long and 1⅝ inches in diameter. Note holes drilled in the center of the pins. Oil circu... on is forced through centers of main bearings, assuring positive lubrication at all times. Connecting rod bearings ... anned for oil delivery. Note oil rings on ... crank shaft. The ... ce ... the webs are also drilled so that there is a circulation of lubricant to the connecting rod bearings. Splash feed is optional.

chored to cross members of the main frame, suspension of both motor and transmission being by four points.

THE SPRING SUSPENSION

The front springs are 34 inches long, have ten leaves graded and lipped 2 inches wide and are perched 2 inches off center, special spring steel being employed. The rear springs are 42 inches long having 10 leaves, graded and lipped 2 inches wide and are shackled at both ends. The rear spring hangers are of the goose-neck type provided with a non-turning over shackle while the forward ends are anchored to drop forged steel shackles which also serve as anchorages for the drop forged steel side strut rods and the rear springs oscillate or swivel on the axle tubes.

The radiator approaches the square tube design of a perfected type and is of ample storage capacity, which with the belt driven fan provides a generous supply of cooling water under all conditions of service. The front axle is strong in appearance and is a little heavier than need be but like the side strut rods, the stout springs, having more leaves than are generally used, it is but another added factor of safety and of these there cannot be too many under present conditions of extended pleasure touring over all sorts of roads. This front axle is of drop center formation, the I-beam effect being obtained by milling, a forking in one continuous piece of chrome nickel steel. It is 1⅝ inches wide, and 2½ inches deep. Contrary to usual practice the spring clips pass through the axle itself, these being of heavy formation, half oval design and sufficiently staunch to withstand the hardest possible strain of continuous service. The clips are 1⅝ inches wide, hence of sufficient size to ensure positive spring anchorage. The steering knuckles are of the inverted Elliott type drop forged and the steering pins are 1 3-16 inches in diameter turning in hardened and ground bushings in the knuckle. The drag link of the cross steering connection is of steel tubing of heavy gauge while the cross connection itself is drop centered to conform to the shape of the axle and is carried behind it free from road obstructions.

The steering gear is of the irreversi

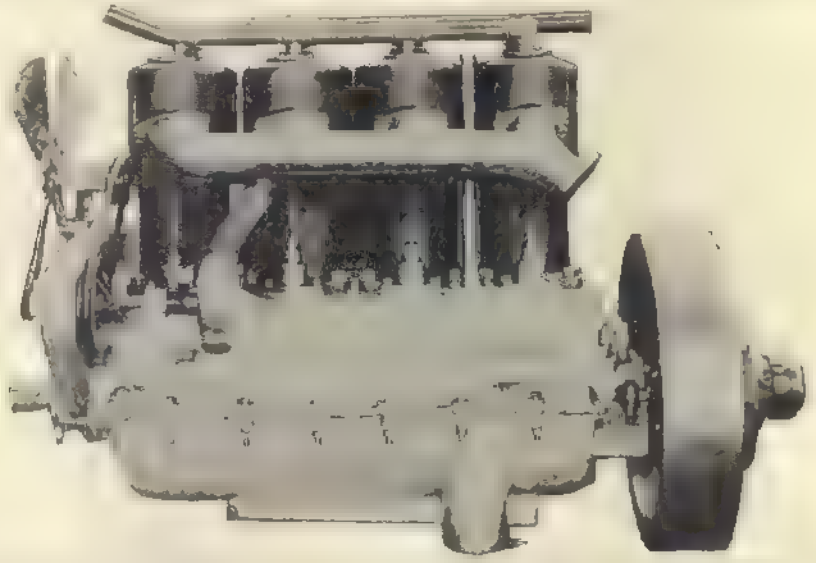


Fig. 6 Exhaust side of Berkshire 1910 T type motor, cylinders cast separately which makes it possible to employ a five bearing crank shaft. Note oil well in lower section of crank case, water pump and liberal exhaust manifold. Flat seated valves as used in the Berkshire 1910 motor make for speedy and complete scavenging of burned gases. Upper crank case section forms half of the timing gear housing.

ble type with worm and sector, adjustment for wear being provided throughout. The steering connections are fitted with ball and socket joints. The worm and sector are hardened and ground and lapped into place, another precaution to attain accurate assembly. The steering column is of heavy gauge steel tubing fitted with an 18-inch hand wheel, the column being 1¾ inches in diameter. The spider of the steering wheel is of aluminum, the spark and throttle lever being located above the spider, working on a quadrant. The foot accelerator is conveniently located on the floor board and actuates the throttle regardless of the lever on the steering wheel.

Wheels are of the artillery pattern built of selected second growth hickory, there being 12 spokes in both front and rear members. They are 36 inches in diameter and the roller bearings together with the wheel base of 118 inches in the standard touring car, 106 inches in the runabout and pony tonneau types, make for easy riding on the road.

An auxiliary oil tank is carried inside the chassis on the right hand side of the car under the driver's seat and a hand force pump provides for delivery from this tank to the crank case Fuel, fed by gravity, is carried in a 16 gallon tank located under the driver's seat. A metal under pan completely houses the motor and transmission and large fenders protect the occupants from the mud or water thrown up by the wheels. The fenders have a long graceful sweep. The forward fenders are not secured in the ordinary manner but instead a strong steel support for both fenders and lamps is

a low half oval design which adds materially to the racey appearance of the car.

The standard touring car sells for $2900, the runabout and toy tonneau at $2650 and the landaulet at $3500

ON THE ROAD.

The best proof of the worth of any car is the manner in which it performs on the road, up hill and down, under all conditions. The writer was given a road demonstration of a Berkshire toy tonneau model, Thomas Clarey at the wheel. Pittsfield was left at 10.45 A. M. for a run over the roads through New York State, Pittsfield being of course close to the State

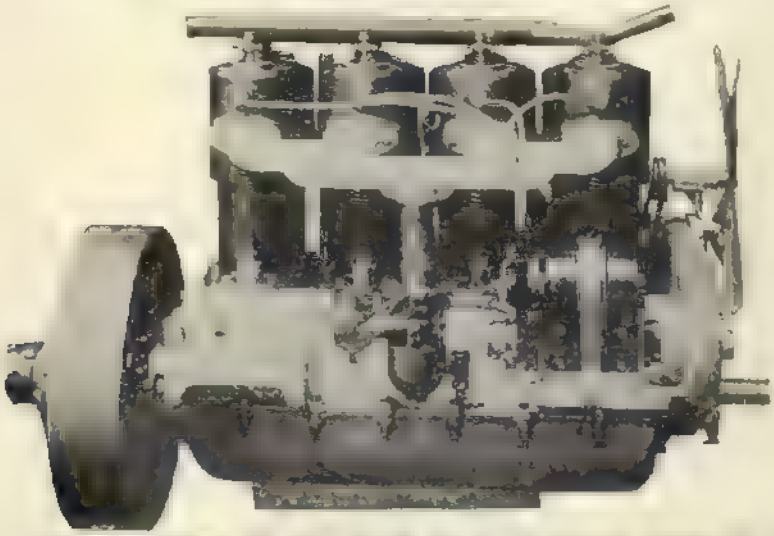


Fig. 1. Inlet side of Berkshire 4-cylinder motor. Note [illegible] asymmetrical inlet manifold, [illegible] magneto, water jacketed carburetor [illegible] the automatic type. Note [illegible] arrangement. The [illegible] is furnished as regular equipment [illegible] with [illegible] and self starter. Magneto [illegible] driven through [illegible] from the timing gear shaft

fitted. It consists of two vertical side members secured to the chassis side members, and at the highest point of these is joined a cross member which extends sufficiently over the wheels to act as a support for the fenders. The lamp brackets are also brazed to these upright members so that the whole forms an integral unit of strong construction and obviates that annoying rattle of lamps and fenders so common on many cars, especially when the clutch has been disengaged as in coming suddenly upon crowded traffic and the engine must for a time race a bit. The lamp brackets are carried midway between the top and bottom of the vertical members.

The bodies of Berkshire cars represent the best in construction and are nicely finished, the standard color being maroon body with English vermilion running gear which makes a harmonious combination. Other color schemes are obtainable, of course. A variety of leathers is at the option of the purchaser. All Berkshire bodies are of sheet aluminum with wood panels. The dashes are of mahogany of

line. The roads in that section of the country, that is the main traveled highways, are very good and conditions are ideal. After leaving Pittsfield and making for Nassau, over in New York State, this route, while not as long as some that might have been followed, was rather hilly and a good test of the car as it was geared 2½ to 1. Just outside of Pittsfield there is a long hill which was surmounted without difficulty, though the motor was throttled down by the driver as a demonstration of the capability of the car at hard work on the high gear. A car geared lower obviously would make the hill somewhat easier but no attempt was made to rush the grade as would be done under ordinary touring conditions. Other cars with a lower gearing bound in the same direction were easily passed without the slightest strain on the motor. From the top of the Lebanon grade one has a long coast down into the valley which leads into New York State. There are plenty of grades further on. One might go anywhere and yet not secure a more conclusive demonstration of ability to get there.

Taking out time for a stop for a light lunch at Lebanon of ¾ of an hour a trip to Nassau and back a distance of 60 miles was made in 1 hour and 35 minutes, yet no attempt to speed was made.

On the run back Lebanon was a different proposition than on the trip over to Nassau, for while the roads were good, yet it was a long, hard climb and the car behaved splendidly. John McQuade, president of the company, accompanied the writer who sat on both the front and rear seats and on either the passenger was comfortable, the absence of vibration was noticeable. During the entire trip recourse to the lower gears was not once made. During the long, hard tug up the hill the motor did not heat up and performed exceptionally well. A test of brakes revealed that either the foot or the hand lever were positive, and in response to the throttle the motor accelerated exceptionally well, yet during all was very quiet in operation, the clutch working smoothly. The roads in that particular section of the country while they are good abound in steep grades, so it is doubtful if a more lengthy demonstration would have brought out any more conclusively the efficiency of the 1910 Berkshire.

## HOW SOME OF THE RECENT AUTO RACES WERE TIMED

The timing arrangement, which is manufactured by the Warner Instrument Co., of Beloit, Wis., consists of a revolving drum covered with a ruled sheet of paper, on which a pen traces a spiral line. Whenever a car passes the wire, the pen is pressed to one side and held there for an instant, leaving a deep indentation in the line on the paper. The paper is ruled across for every five seconds that the pen travels, and besides this, the pen is arranged to mark seconds so that each second is shown by a notch in the line. Each line has sixty notches and covers one minute. Every ten minutes an extra wide space is left between the lines.

Two men are required to keep the record. One of them watches the cars as they pass and calls off their number and time to the other, who sets it down on a separate sheet as shown in the cut. For instance, as a car approaches, the man standing at the instrument calls the car number, and presses the key that he is holding in his right hand to connect the instrument with a wire that is stretched across the track about four inches from the ground. When the car strikes this wire an electric circuit is closed that works the pen.

The operator calls off the time of that car at once in minutes and seconds, and tenths of a second. The man seated beside him enters it on the Race Time Sheet in the proper space, and by making the subtraction secures the elapsed time, which is posted on the score board. The track wire is then disconnected until another car approaches.

Where it is necessary to register the time of cars at a distant point, another operator is stationed at that point with another key, which is electrically connected with the recording instrument. He is connected also with the first operator by telephone through the same wire. As a car approaches the second operator he calls its number to the first, who repeats it to be written down. Then he closes the key and the car striking the wire makes the registration, which is also called off and noted.

The "Warner" Timing Instrument

The recording instrument is in the center of the picture, and the pen is plainly shown, tracing a line on the paper that covers the drum. The chronometer controls the mechanism that drives the recording instrument and keeps the pen synchronized with it. Any error in this respect can be instantly detected on the record, because the notches that indicate seconds will no longer coincide with the cross lines.

## AVIATION MEET AT RHEIMS

What was undoubtedly the most successful demonstration of the capabilities of aeroplanes for aerial navigation took place at Rheims, France, from August 22nd to August 29th inclusive.

On the eve of the first day's events a heavy rain storm raised doubts in the minds of the contestants and visitors as to whether the flights on Sunday would take place, but, nevertheless, the following morning about fifty thousand people braved the elements and were present at the aerodrome to see the initial race of that form of craft which promises to play an important part in the future history of at least a goodly portion, if not all, of the world.

By taking advantage of the pauses between the showers several interesting flights were made. Hubert Latham in his Antoinette monoplane completed two circuits of the course at a height of 250 feet in nineteen minutes. His official lap time for the "Tour de Piste" (10 kilometres) was nine minutes and forty-seven seconds. Count de Lambert came next making three laps in twenty-nine minutes, two seconds. Following Lambert came five other aeronauts, Sommer on his Farman, Cockburn, Delagrange, Fournier and Lefebvre, on a Wright, all in quick succession. The Wright machines scored the highest honors on the first day making the best times and distances.

On Monday the weather was fair and the events were exciting. The first flight was that of Paulhan, on his Voisin biplane, who made 35 miles in less than an hour. The lap record made the previous day by Lefebvre on a Wright machine was captured by Bleriot who promptly handed it over to Curtiss.

Tuesday proved to be another inclement day but however there were many graceful and spectacular flights made by Bleriot, Paulhan and Curtiss.

M. Roger-Sommer again made a long-distance flight, staying in the air about an hour and a half. The crowd of spectators, like the day before was too widely scattered and too large for its size to be estimated.

Close view of the Aeroplane sheds at Rheims showing seven monoplanes being prepared for flight. The one in the foreground is Blériot's. The entire front of the shed can be removed as shown so that the machines can be rolled in or out without turning them around.

[illegible] of the [illegible] machines making ready for a start. This picture shows men steadying the machine on its central part [illegible] carry the position occupied by the aviator and the wheels at his left for controlling the [illegible] the auxiliary planes near the ends of the main wings. It also shows the hinged [illegible] upward about half way between the [illegible] the wing tip to keep the wing tip from striking the ground.

High winds and minor accidents prevailed on Wednesday and there was only one notable flight. Paulhan, on a heavy Voisin, although hampered by the bad winds, broke Wright's time record by 23 minutes, covering 82 miles in 2 hours and 43 minutes

On Thursday the honors were taken by Latham, who covered 96 miles beating the distance record made by Paulhan the day

An interesting [illegible] incident during Aviation Week at Rheims when three heavier than air machines competed for mastery, circling [illegible] course in rounds at express train speed [illegible] and certainly [illegible] been close on "[illegible] firma" with horses or automobiles. The [illegible] machine is Latham's monoplane, followed by Lefebvre in a Wright biplane and Hubar Varilla in a Voisin biplane.

Paulhan making a successful turn during one of his flights at Rheims, France. This daring aviator, although comparatively a novice, handled his [illegible] with skill and daring.

before. He also made new speed records for distances over 30 kilometres. His times were as follows: 90 kilometres, 1 hr. 19 min. 56 2-5 sec.; 100 kilometres, 1 hr. 28 min. 17 sec.; 120 kilometres, 1 hr. 45 min. 32 sec.; 140 kilometres, 2 hr. 3 min. 54 sec.; 150 kilometres, 2 hr. 13 min. 9 3-5 sec. Another good flight was made by Bleriot, who, carrying a passenger, covered ten kilometres in 8 minutes and 38 2-5 seconds.

Several unsuccessful attempts were made by Paulhan on Friday to beat the distance record made on Thursday by Latham and his machine was damaged later on in the day. Farman succeeded in setting a new distance record of 111.35 miles making it in 3 hours, 4 minutes 56 2-5 seconds

On Saturday the honors fell to America when Glenn H. Curtiss won the Gordon-Bennett cup. This cup is held for one year and is to be competed for annually. The results of this contest were as follows:—

1. Glenn H. Curtiss (America), Herring-Curtiss biplane, 15 min. 50 3-5 sec.
2. Louis Bleriot (France), Bleriot monoplane, 15 min. 56 1-5 sec.
3. Hubert Latham (France), Antoinette monoplane, 17 min. 32 sec.
4. Eugene Lefebvre (France), Wright biplane, 20 min. 47 3-5 sec.

George Cockburn (Britain), Farman biplane, did not finish.

Sunday was another successful day for Curtiss who won also the Prix de Champagne. The following were the results of this event:—

First prize (£2,000) ....M Henri Farman
Second prize (£1,000) .M. Hubert Latham
Third prize (£400) ..M. Louis Paulhan
Fourth prize (£200) ..Comte de Lambert
Fifth prize (£200) ....M. Hubert Latham
Sixth prize (£200)..... . M. Tissandier

There were numerous mishaps on Sunday to mar the pleasure and interest of the flights. Louis Bregnet's machine was completely wrecked, and Bleriot's aeroplane caught fire while he was in the air, the aeronaut being badly burned.

Close view of Bleriot in one of his new monoplanes driven by a 35 H. P. 8 cylinder E. N. B. motor. This view shows the method of mounting the bicycle wheels also the frame work and shows a man in the act of twisting the propeller at the front to start the motor. It also shows clearly the seat arranged for the aviator and the small wheel on a steering column provided with controls for the motor, following automobile practice. The aviator's feet also rest on pedals which assist in the control of the machine.

Close view of Farman in his biplane with which he made his long flight at Rheims, France. This picture shows the hinged vertical rudders at the extreme rear forming a pair [illegible] the forward horizontal rudder or elevator is also shown as well as the hinged auxiliary planes at the outer ends of the main wings. This machine is fitted with both skids and wheels as shown

## THE NATION HONORS THE WRIGHT BROTHERS

Because the first successful public flights of the Wright aeroplane, with the exception of the few flights made by Orville Wright at Fort Myer last year before his accident, were made in Europe, European powers were the first to have the opportunity of showering honors upon the inventors and European kings and presidents to personally congratulate them.

America, however, has now had her opportunity to personally express her admiration. On June 10 the brothers were received at the White House and President Taft conferred upon them the medals of the Aero club. On June 18 the nation's medal was presented to them at Dayton, Ohio. The obverse side has a profile of the Wrights, side by side, their names, the coat of arms of the United States and the words: "In recognition and appreciation of their ability, courage, and success in navigating the air." The reverse side bears an allegorical figure carrying a flaming torch and flying through the clouds above the surface of the earth. Above is a phrase from the Bible, "Shall mount up with wings as eagles."

The state of Ohio and the city of Dayton also presented medals to the brothers.

## ORVILLE WRIGHT PERFORMED AT BERLIN

Orville Wright made two successful flights over the Templehof parade ground at Berlin, Germany, on September 11. In the first he was aloft alone for forty-two minutes. A strong breeze was blowing. His second flight, with a passenger, Captain von Kehler, was of short duration.

## WASHINGTON AFTER AERIAL MEET

At a joint committee of the Chamber of Commerce and the Washington Aero Club recently it was decided to formally apply for the 1910 International Aviation Carnival to be held at Washington. The application will be made to the Aero Club of America.

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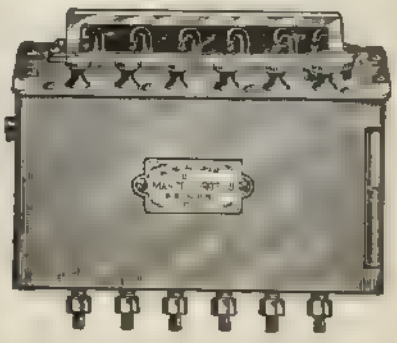

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## NEW YORK Y. M. C. A. TO OPEN SCHOOL OF AERONAUTICS

To meet the rapidly growing demand for men trained to build, repair and operate aeroplanes and dirigible balloons and also to prepare others for the sport of flying, the West Side Young Men's Christian Association, 318 West 57th street, on October 13 will open an evening course in aeronautics under the direction of Wilbur R. Kimball, the well known electrical expert and practical aeronaut.

The School of Aeronautics owes its existence to the experimental or test course of lectures given at the West Side Branch last spring by Cortland Field Bishop, President of the Aero Club of America· Augustus Post, Secretary Aero Club, Winthrop E. Scarritt, former President of the Automobile Club of America, and others.

The first course of study is designed to prepare owners and prospective owners for participation in and enjoyment of aerial sport; to train aero chauffeurs and mechanics in the principles of aeroplane management; to teach practical men the principles of construction; to aid civil and mechanical engineers who wish to learn the applications of their science to flight and to prepare writers, newspaper men, advertising men and salesmen to specialize in the new field.

No attempt will be made in the first course of ten evening lectures and demonstrations to give students actual flying practice though this phase of instruction may develop later. There will, however, be ample work in flying models and in constructing miniature planes of various types.

## INCREASE IN PATTERN WORK DUE TO AEROPLANES

In all parts of the world men who are at all of an inventive turn of mind are turning their attention to experimenting with aeroplanes and other devices for flying above the earth, thousands of machines being constructed that never go into the air and many thousands of workmen are kept employed, the effect upon some lines of industry being clearly felt. At a recent meeting of the Pattern Makers' Union of New York, is was announced that mostly all the members were at present employed, many in the manufacture of aeroplanes for experimental purposes.

The American Aviators' Exhibition Company of Chicago, Ill., announces that its first exhibition of flying machines will be held in Chicago, October 9 and will extend through sixteen days. It is said $33,000 in prizes will be awarded. The best woman operator and the youngest operator are to be awarded $1,000 each. Other contests are for speed, appearance, lightness and operation. Glenn H. Curtiss will make five flights.

View of M. Lewis Blériot arriving at Dover at 5.12 A. M. on Tuesday, July 25th, the first man to cross the English Channel in a heavier than air machine, thus winning the Daily Mail prize of $5,000. The wind was blowing at the rate of 30 miles an hour during his flight which lasted 37 minutes and covered a distance of 31 miles. A French torpedo boat destroyer attempted to accompany him but was completely distanced by the Blériot monoplane. The total span of this machine is only about 25 ft. 3 in. with a sustaining surface of about 150.6 square feet. The motor is a three-cylinder Anzani of 22 to 25 H. P., weighing 132 lbs. The propeller which is 6 ft. 7 inches in diameter is made in layers of selected French walnut, making a propeller which is claimed to be superior to the metal ones on account of absorbing the shocks of the explosive motor and not causing the blades to vibrate. It is claimed that the propeller will stand 15,000 revolutions per minute without any exception. The total weight of the machine including the aviator and fuel for three hours, is about 880 lbs. His arrival was somewhat unexpected as shown by the lack of people to witness this star performance.

## BRIEF DESCRIPTIONS OF THE MOST PROMINENT AEROPLANES

### WRIGHT BIPLANE.

The Wright Brothers were the first to build and successfully use the double-deck motor-propelled aeroplane, and their machine is the outcome of extensive trials with the Chanute type of double-deck gliding machine. The essential features of the machine are the double main planes, the duplex front rudder for up-and-down steering, and the duplex rear rudder for side steering. The engine drives two propellers through chain gearing. As the machine is mounted on sledge runners it has to be started by an auxiliary catapult-like apparatus running on a rail. This gives the machine its initial launching velocity, and the propellers do the rest. Balancing of the machine is obtained by warping the extremities of the main planes. The method of control is highly ingenious. It will be noted that the Wright is a tailless machine, while most of the French aeroplanes have tails. The Wrights rely mainly on the operator's control of the machine to preserve the balance when this is threatened with disturbance. It may be mentioned, however, that they have recently patented an automatic stabilizing arrangement.

### VOISIN BIPLANE.

This is one of the earliest types of French machines, and has many characteristic features. It differs from the Wright in that it has a tail with vertical panels which give a certain amount of automatic stability. Vertical panels between the main planes conduce to the same end. A single propeller is employed, driven direct from the engine. The machine is mounted on wire wheels, and thus can run along the ground to get its initial velocity before rising into the air. The rudder for vertical steering is a single plane, and the rear rudder is placed within the box tail. Of the Voisin it may be justly said that it is the parent type of the French school of biplanes, and it has developed to its latest form the plan of making the machine capable of being started without the aid of an auxiliary apparatus. The box tail and the supporting wheels add materially to the weight, but these attachments have very many advantages, and it does not seem that they will be readily abandoned.

### FARMAN BIPLANE.

Mr. Farman, a naturalized Frenchman of English parentage made his name in aviation on the Voisin machine. He then set up for himself and turned out an aeroplane of his own design. In many respects the Farman is like the Voisin, but there are numerous radical differences. Extensions to the main planes serve as auxiliary stabilizers. The machine is mounted on a combination of sledge runners and wheels whereby it can start in the manner of the Voisin, but can use the sledge runners when landing, and thus save the wheels from damage. A modified form of the box tail is employed on this machine, and there is also only one single elevating rudder, mounted far in front of the main planes. The operator is seated well forward, and the engine is placed immediately behind him whilst in many other machines it is situated beside the operator. This biplane has come to the front in remarkable fashion.

### CURTISS BIPLANE

The machine designed by Glen H. Curtiss is in several respects a curious blend of the typical American and French machines, and yet the net result is a machine which can be readily distinguished from either. Like the French Biplanes it is mounted on wheels and thus can start without a special apparatus. Like the Wright it has a double rudder in front for vertical steering. Auxiliary stabilizing planes are fitted between the main planes. The machine is notable for its small bearing surface and its very light weight. An air-cooled engine is employed whilst most of the other biplanes use water-cooled motors. The front elevating plane and the rear rudder are mounted at considerable distances from the main planes. Nevertheless, material has been saved all round in such a manner that the total weight is little more than half that of some other machines. Mr. Curtiss differs radically from the Wright school, and has been designing aeroplanes and engines for several years.

### R. E. P. MONOPLANE

M. Robert Esnault-Pelterie has been experimenting with the monoplane for many years, and he has achieved no small measure of success, though he does not court publicity. His machine approximates to the Bleriot in general outlines, but here again a wealth of detail differences are to be noted, every one of them of importance according to the designer. The machine is very strongly built and the whole design makes for compactness. The engine is of M. Esnault-Pelterie's own invention, and thus he is one of the few aviators who has designed the aeroplane and the engine and drives the resulting machine. At the tips of the main plane there are supporting wheels to prevent their being injured by rough contact with the ground. The elevating plane is mounted at the rear of the machine whilst the rudder for side-steering is placed low near the keel. There is a vertical fin for improving the stability. The whole machine

is very staunchly built, for M. Esnault-Pelterie believes in having an apparatus which can stand the hard knocks that it is likely to receive.

BLERIOT MONOPLANE.

M. Bleriot is the pioneer of the monoplane, and he has spent years in bringing the machine to a satisfactory stage. The monoplane has a single main bearing surface with minor planes for balancing. The main planes spring out from a central body, in the fore part of which is mounted the motor and behind it the pilot. The single propeller is placed right in front of the machine, and this is of the tractor type. High speed is the characteristic of the monoplane and M. Bleriot's flight across the channel has proved the importance of this type. The minor plane at the rear has flexible tips which are under the control of the pilot; they act as rudders for controlling steering in an upward or downward direction. Further to the rear is the single rudder which steers from side to side. The motor used is the three-cylinder Anzani, and it is notable that M. Bleriot employs an engine of comparatively low horsepower. The machine is mounted on three wheels and is wonderfully compact and speedy

SANTOS DUMONT MONOPLANE.

The first officially recorded aeroplane flight in Europe was made by M. Santos-Dumont, and on a machine of his own design. Thus he has had very great experience, and yet of late years he has not been able to equal his rivals in length of flight. He favors a very small machine—so small and compact that it can be packed upon a motor car—and he seats himself under the main plane with the engine above him The Demoiselle, as his little flyer has been named, is most ingenious, and has made many short flights, but so far it has not shown as much stamina as the larger machines. In this machine Santos Dumont gets away from the long central body which is so prominent a feature of the other monoplanes, but the position of the engine above the aviator is open to many objections As an instance of how to build a flying machine with a minimum of material the Santos-Dumont monoplane is highly interesting. The design is to be considerably modified, but M. Dumont will still probably work on the assumption that most machines are needlessly bulky, and we may expect some highly interesting results

ANTOINETTE MONOPLANE

At first sight the similarity between the Bleriot and Antoinette monoplanes is considerable, but close examination shows that they differ in very many features. There is the usual main body with the main planes on each side of it. The bodies differ in shape and the Antoinette is notable for the manner in which the engine, radiators, or water-coolers, are mounted along the frame. A very powerful motor is fitted and this is of a special type in which the usual carburetor is dispensed with. The rear fins and planes are of unique design on the Antoinette and the rudder is in duplicate. At the rear of the main plane are flexible extensions which can be manipulated by the pilot. They serve to assist in the balancing of the machine. Another novel feature of the Antoinette is the mast, or spar, which rises up from near the center of the machine. From this cables extend to the main plane, bracing them very securely.

## $25,000 AERO RACE.

An aeroplane contest with financial rewards equalling the richest English turf prizes will result from the match race between Louis Bleriot and Hubert Latham when they meet in London the latter part of October. It was reported recently that the two men have placed a big side bet on the outcome. Besides this, there are two prizes of $15,000 and $8,000, the winner to take $12,000 of the former prize and the whole of the latter. These, with the side bets, will make the race worth close to $25,000.

There is intense rivalry between the two Frenchmen, owing to the fact that Bleriot was first to cross the English Channel in an aeroplane, after Latham had tried and failed.

## AVIATOR KILLED BY FALL

E Lefebvre, the French aviator, who played a prominent part in the recent Rheims Aviation meet, was killed on Sept. 7, at Juvisy-Sur Orge, France, by a fall while testing one of several new Wright aeroplanes which were being prepared for delivery. He was flying at a height of only 20 feet when the machine swerved sharply downward and struck the ground with great force. The cause of the accident is unknown but he had been known for his daring performances and reckleseness, and during one of the Rheims races he was fined for reckless flying

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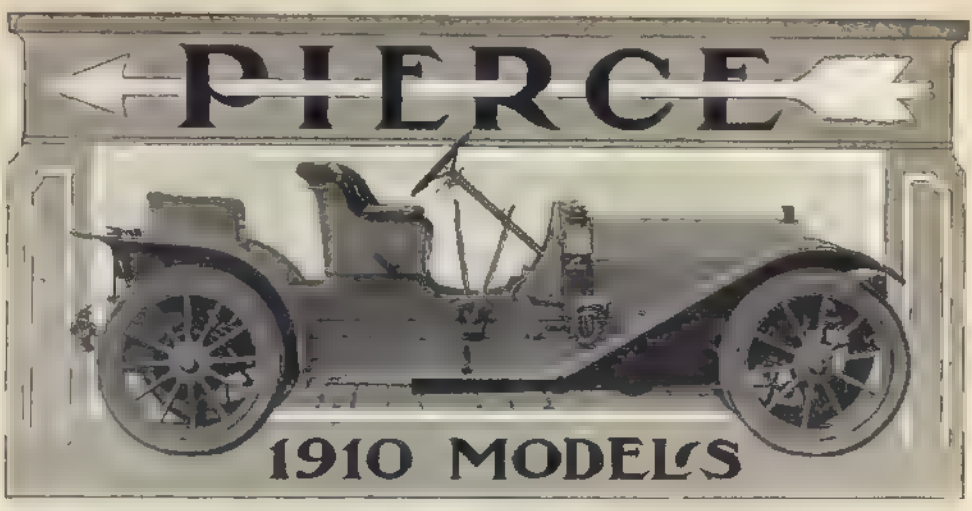
Glenn Curtiss says apropos of military critical comparison between dirigibles and aeroplanes: "There are two things at present which are retarding long-continued high flights by aeroplane. The first is the nerve of the operator, the second, the fear that the motor will suddenly stop or develop other troubles that might make a quick descent from a high altitude dangerous. With the going of the motor troubles will come in the nerve of the operator."




BY CHARLES B. HAYWARD.

"Sixes," because the Pierce-Arrow Motor Car Company, of Buffalo, N. Y., has definitely decided that for this coming season it will devote its entire attention and manufacturing facilities to the six-cylinder type. Consequently, the entire 1910 line will be comprised of sixes. This not only simplifies manufacturing but has also been responsible for a reduction in the number of models listed. Instead of five distinctive chassis, as was the case with the 1909 output, there are but three for 1910. But as there were two fours, the 4-24 town car and the 4-40 touring type last year, this does not mean an actual reduction in the number of types listed apart from the elimination of the fours. It is with full confidence, not alone in the present status of the six-cylinder type, but likewise in its future, that the Pierce Company has taken this step and the extent to which its faith in the demand reaches is evidenced by the fact that plans have been made for an increase of fully 50 per cent. over last year's production, when both types were turned out.

The 1910 Pierces, the first models of which won the Glidden Tour, are of 36, 48 and 60 H. P. respectively. The first cars turned out were the four entered in the tour, and, owing to the late date at which the last of the 1909 product left the factory, they were only finished a few weeks prior to the start from Detroit. The time available in which to try them out on the road was very limited, particularly in the case of the last two of the quartette to come through. The "thirty six" is referred to as the "small Pierce," though when compared with current standards it will be evident that it is a large machine in reality, though it has been designed strictly as a five-passenger car.

It goes without saying that no radical changes have been made. Regardless of how perfect a point of development a machine may have been carried to, experience in the manufacture and running of a large number of cars always serves to bring to light minor changes and improvements here and there that will conduce to the greater comfort of the owner, or the better performance of the machine as a whole.

Additions constitute the major part of the improvements, and while small individually, regarded in the aggregate, they are of no inconsiderable moment, particularly when the cost of making them on such a large series of cars as the Pierce Company will turn out for 1910 is taken into consideration. However, the list prices will remain unaltered.

THE PIERCE SIX THIRTY SIX.

Following the policy just adopted last year, the motor of this car has its cylinders cast in pairs, but the cylinder diameter has been increased by 1-16 inch, or from 3 15-16 to four inches. There has been a corresponding increase in its power output, but as its rating of 36 H. P. is more or less nominal, the motor as formerly constructed showing a capacity in excess of this figure, no change has been made in its rating. Copiousness of lubrication has always been a prominent feature of the Pierce oiling system and as a great deal more oil than necessary was being forced to the cylinder walls, in last year's motor, it has been found advisable to supplement the baffle plates in the crank case by an oil ring on the bottom of the pistons. Experience with this has shown it to give an additional mileage of fully 50 per cent. on a single charge of lubricating oil, beside tending to give a cleaner

exhaust and keeping the interior of the motor cleaner. The housing of the gear set has been raised ¼ inch, which admits of reducing the travel of the speed change lever necessary and facilitates operation. The shifting lever itself has also been lengthened 2 inches, while the arrangement of the foot brake and clutch levers has been altered so as to provide for greatly increased leverage, making it much easier to apply the brake or disengage the clutch. Naturally, these are all changes that would not be apparent even upon an actual comparison of a 1910 model with its predecessor, except where particularly when compared with American standards in this respect generally, a further increase has been thought advisable in view of the greater power of the motor. On the 36 H. P. car, the brake drums have been made ½ inch wider and of 1 inch greater diameter, increasing the effective braking surface by almost 20 per cent. Raybestos friction lining is specified and will be 3-16 inch thick, instead of 5-32 inch, as formerly. A great improvement in the appearance of the car has been made by placing the front axle 3½ inches further forward, and by bringing the load entirely between the axles. This also adds

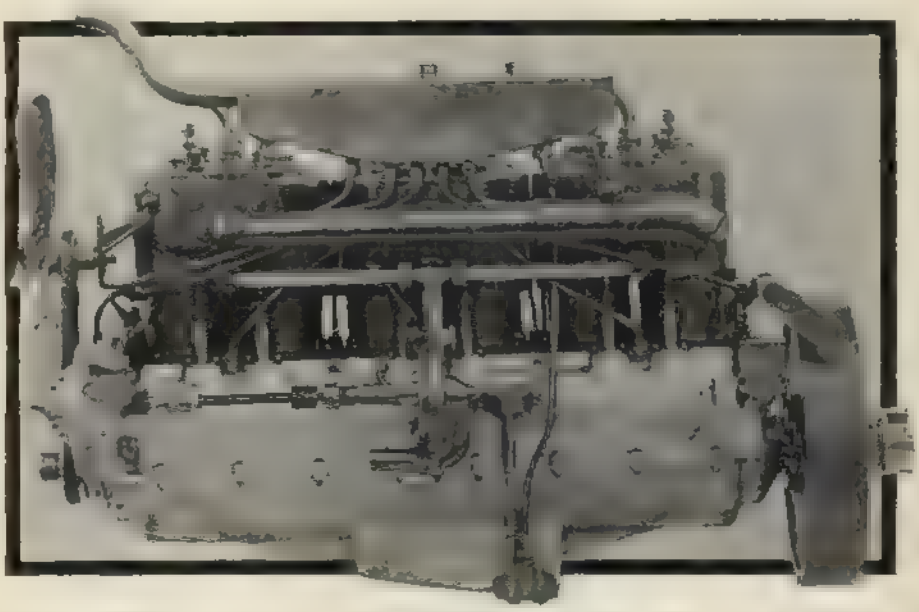


Fig. 1. Exhaust side of Pierce 6-48 motor. This view shows the oiling system with the raised tank in its new position over the exhaust pipe and the method of driving the gear pump which takes [illegible] as oil [illegible] tank after it has passed into the engine [illegible] been strained. It also shows the water pump, fan mounting, and at the forward end of the pump shafts the small bronze pinion which drives a power tire pump fitted to Pierce cars.

measurements were taken, but they go to show the amount of thought and study that is devoted to the smallest details of the design and construction.

Probably the most radical change to be found on the entire car is the substitution of Timken roller bearings in the wheels instead of the Hess-Bright formerly employed. On the front wheels, the annular type has been displaced altogether, while on the rear, the bearing equipment now consists of a Hess-Bright inboard bearing and a Timken roller type on the outer end of the axle. The much greater ability of the roller type to withstand heavy thrust loads, even far in excess of its normal radial capacity, has naturally, been responsible for this change on the front wheels.

Despite the fact that Pierce brake area allowances were already unusually liberal, to the riding qualities. It entails an increase of 6 inches in the wheelbase, which is now 125 inches, instead of 119, and also gives an extra 2½ inches of leg room in the tonneau. The width of this body in the rear has also been increased by 3 inches, involving an entirely new set of patterns for the large aluminum castings employed in the Pierce body construction. The foregoing refers to the standard touring type of body, but the miniature tonneau will also be 2½ inches longer, while the brougham and landaulet bodies will be 6 inches longer inside. They will comfortably accommodate three passengers on the rear, and will have two drop seats in addition.

The miniature tonneau and touring bodies will not interchange on the standard chassis owing to the altered locations of the dash, steering column, steering rod,

brake and clutch pedals, and brake and gear-shifting levers necessary in each case. The runabout chassis is special throughout and no other body is made interchangeable with it, the only bodies which have this feature being the touring, landaulet and brougham. The wheelbase of the runabout is 119 inches

To provide the same ample factor of safety as formerly, in view of the extra load imposed upon it by its changed location, the front axle has been strengthened by making the flanges of the die forging heavier. Greater ease of control has been provided for by increasing the diameter of the steering wheel to 18 inches. To meet this condition, the spark and throttle levers have been made 1 inch longer, and the fulcrum end raised 1½ inches, making the quadrant bracket much neater. The running boards have been made two inches wider and the practice of entirely enclosing the space between the running boards and bottom of the under frame by means of a metal apron has been adopted as standard. This serves to entirely enclose the sides of the car between the forward and after mud guards. The latter have also been altered to conform, the front guards now being designed with a straight slope to the rear to facilitate closing in the sides. These guards have also been given a ⅞ inch flange all round.

The desire of the builders to give greatly added value to the Pierce, without putting it on the list price, finds one of its chief outlets in the shape of much larger tire equipment on every one of the three models listed. On the 36 H. P. touring car, landaulet and brougham, this will be 36 by 4 inch front, and 36 by 4½ inch rear. Apart from the increased mileage, the increased size of the tire equipment also makes for much easier riding. This has been further provided for by the adoption of the three-quarter elliptic spring as the standard for the rear suspension on all the models. While somewhat of a departure, this improvement is only the logical outcome of the adoption of this type of spring on the 4-24 and the 6-36 models last year, on both of which it proved very successful. A dropped type of pressed steel frame has accordingly been adopted in order to preserve the body level of the car at the same height, as well as to avoid raising the center of gravity of the machine. This was particularly necessary on the 36 H P. model in view of making 36 inch wheels standard equipment. With the exception of the runabout, the springs are given 1 inch less arch so that the body is no higher with the 36 inch wheels than it formerly was with the 34 inch

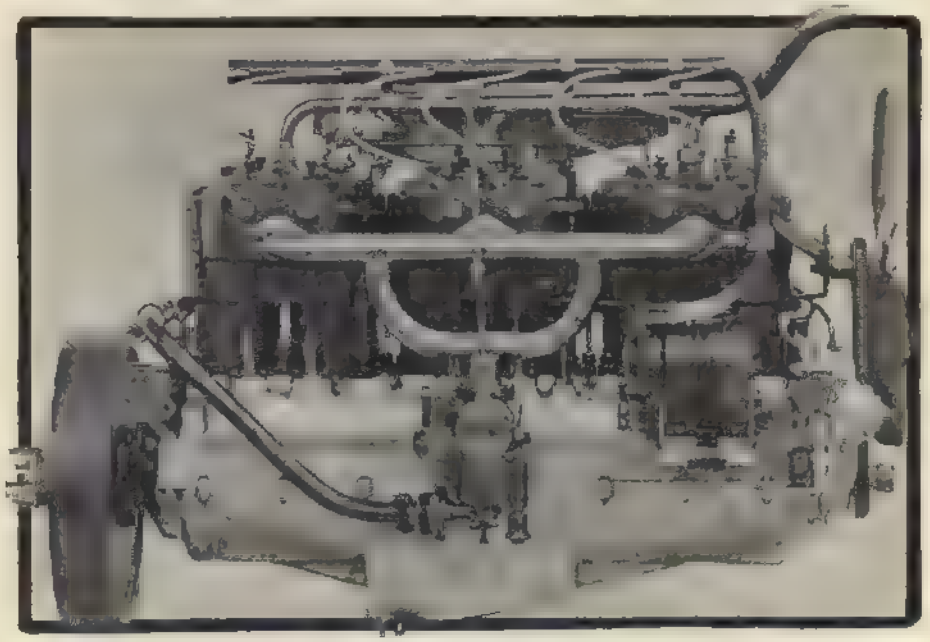


Fig. 2. Inlet side of Pierce 6-36 motor, showing the water jacketed valve chamber, mounting of the magneto, method of wiring, etc.

ADDITIONAL EQUIPMENT

One or two conveniences have been added as part of the standard equipment of the 1910 models, that will doubtless be appreciated. The Pierce was among the very first to fit the Hartford-Truffault suspension as regular equipment and has now gone a step further in this direction

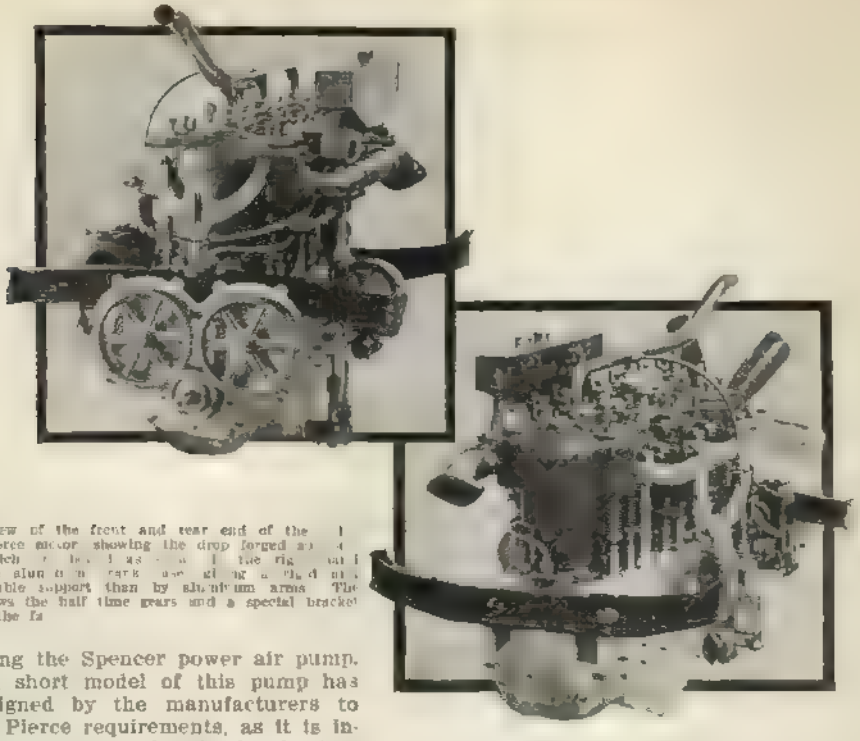


Fig. 3. View of the front and rear end of the [illegible] 6-cylinder Pierce motor, showing the drop forged and [illegible] ing arms which [illegible] the rig[illegible] and [illegible] fixture to the alum[illegible] cases [illegible] g[illegible] a more dependable support than by aluminum arms. The left view shows the half time gears and a special bracket for carrying the fa[illegible]

by adopting the Spencer power air pump. A special short model of this pump has been designed by the manufacturers to meet the Pierce requirements, as it is intended to be covered by the hood when

[illegible] View of the Spencer Power Air Pump now [illegible] Pierce [illegible] pump is driven by [illegible] the water pump shaft and is capable of pump[illegible] air to [illegible] pounds pressure in four or five minutes.

not in use. The pump stands vertically, and, together with a bracket and a large bronze pinion fast to its shaft, is bolted directly to the side member of the frame forward on the left side of the motor. It accordingly lies parallel with the shaft of the centrifugal circulating pump. A small bronze pinion on the latter will afford a means of driving the pump. This pinion is so small and so accessible that it is intended to be shifted along its shaft and into or out of engagement, entirely by hand. A spring-controlled ball and recess lock will serve to hold it in place, either when in or out of mesh. Flexible connections are provided to inflate any of the tires. Owing to its location, the air inlets of the pump are provided with fine gauze screens. The motor is to be run at from 400 to 500 R. P. M. when it is desired to operate the pump, and doubtless the slower speed will be found more desirable.

Instead of the gasoline gauge formerly employed on the tank itself a vertical glass gauge mounted directly on the dash has been specified. This will be plainly visible in daylight and may be illuminated at night by means of a push button which serves to supply current to a miniature electric light. Quite as important as the power inflating equipment for the tires is the provision of a large sized Prest-O-Lite

tank in place of a gas generator. A special compartment for this tank has been designed in the tool box at the rear, and in which it is securely locked out of sight. To avoid the necessity of opening the tool box to turn the gas on or off, a cock is placed just outside. A gas generator will be fitted where specialy ordered, but it will be considered as an extra and must be specified before chassis is assembled.

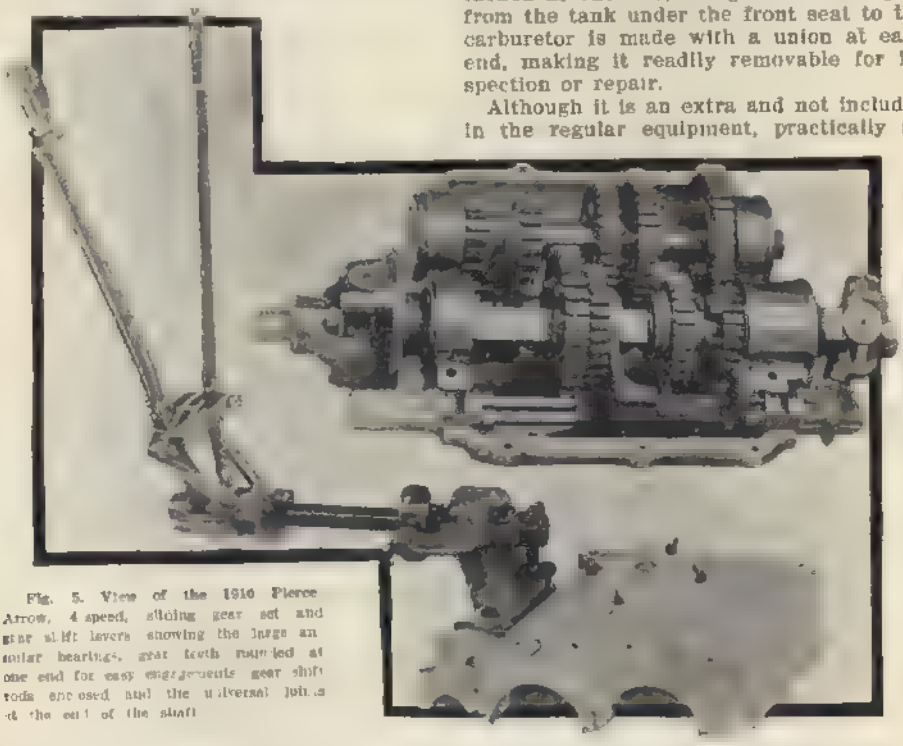


Fig. 5. View of the 1910 Pierce Arrow, 4 speed, sliding gear set and gear shift levers showing the large annular bearings, gear teeth rounded at one end for easy engagement, gear shift rods enclosed and the universal joints at the end of the shaft.

IGNITION

While the Bosch high tension magneto is retained as the standard ignition equipment for the service side of this highly important essential, a change has been made in the reserve system by the adoption of six non-vibrating coil units, and a seventh coil with master vibrator, thus greatly simplifying the vibrator adjustment necessary on a six-cylinder coil. The auto coil is specified and the mahogany case embodies a substantial kick switch of the three point type, giving neutral, magneto and battery connections. The two sets of spark plugs are retained, the ½ inch metric standard as well as the location of the plugs remaining unchanged.

In addition to the clamp hitherto provided on all Pierce cars for holding the adjustable ball thrust at the bottom of the steering column in place, an extra locking plate has been provided in order to absolutely guard against any possibility of accidental looseness at this point. The steering column is now given a slope of 50 degrees on the touring car, brougham and landaulet, and this together with the increased diameter of the wheel greatly facilitates the handling of the car in traffic.

All brake shoe pivots are now provided with bronze bushings instead of being given a direct bearing, and automatic grease cups are specified on all spring shackles. In place of being rigidly attached at one end, the gasoline feed pipe from the tank under the front seat to the carburetor is made with a union at each end, making it readily removable for inspection or repair.

Although it is an extra and not included in the regular equipment, practically all the cars are sold with a windshield, and where ordered, a special divided type will be fitted on the 1910 models.

THE PIERCE 48 H. P. SIX

The motor dimensions on this car remain the same as on the 1909 model, namely, 4½ by 4¾ inches, bore and stroke, though as is the case with the other engines, its rating does not represent its actual power output. An oil ring has been added on the pistons, and the gear set housing raised ⅜ inch, the remaining changes to the transmission being the same as described on the 36 H. P. car. This also applies to the use of roller instead of ball bearings. The brake drums are of the same diameter as previously but have been increased in width by 3-16 inch. The thickness of the Raybestos lining has also been increased.

On this car, the front axle has been brought forward 4½ inches involving an increase in the wheel base from 130 to 134½ inches. The drop frame is specified and

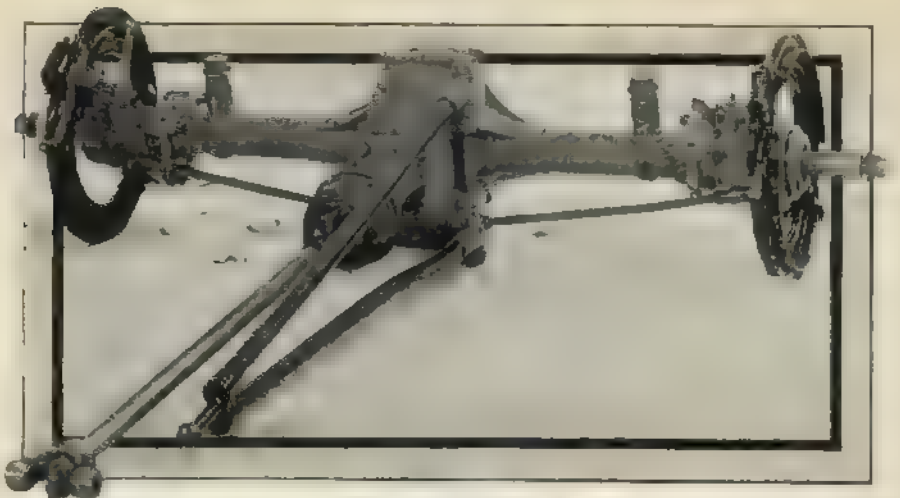


Fig. 6. 1910 Pierce rear axle and propeller shaft with showing the special torsion arm and two steel tubes the thorough housing of the rear universal joint, brake arrangement

the semi elliptic front springs have 2 inches less arch, thus bringing the level of the whole chassis down that much. This has been made possible by the shift in the location of the front axle which takes it away from danger of contact with the crank case

The three-quarter elliptic springs are standard for the rear. On this car, the steering column is given a rake of 49 degrees from the vertical in the touring, landau and suburban types. The touring body has the same seating capacity and room as the 1909 type, namely, seven passengers, but has altered slightly in design in order to conform to the change brought about by the drop frame. The touring car, landau and suburban bodies are all made interchangeable on both the 48 and 66 H. P. standard chassis. For the runabout and miniature tonneau bodies, the 48 H. P. chassis is special, the wheel base being 128 inches, with the center line of the front axle directly under the front of the radiator. These two bodies will also interchange on the 66 H. P. chassis.

It is in the tire equipment of the 48 H P. car that a radical departure is to be found. This will consist of 36 by 4½ tires front and 37 by 5 inch rear, this being the first instance in which this new and odd size has been adopted. At first sight it would appear as if this would cause inconvenience, but this is not the case as despite their difference in diameter the front and rear tires are interchangeable. This is made possible by making the tires with exactly the same retaining beads, their only difference of dimension lying in the diameter. The rims employed on all four wheels are accordingly identical. It would doubtless not be good practice to have a 37 inch tire on one driving wheel and a 36 inch on the other, as when used for any

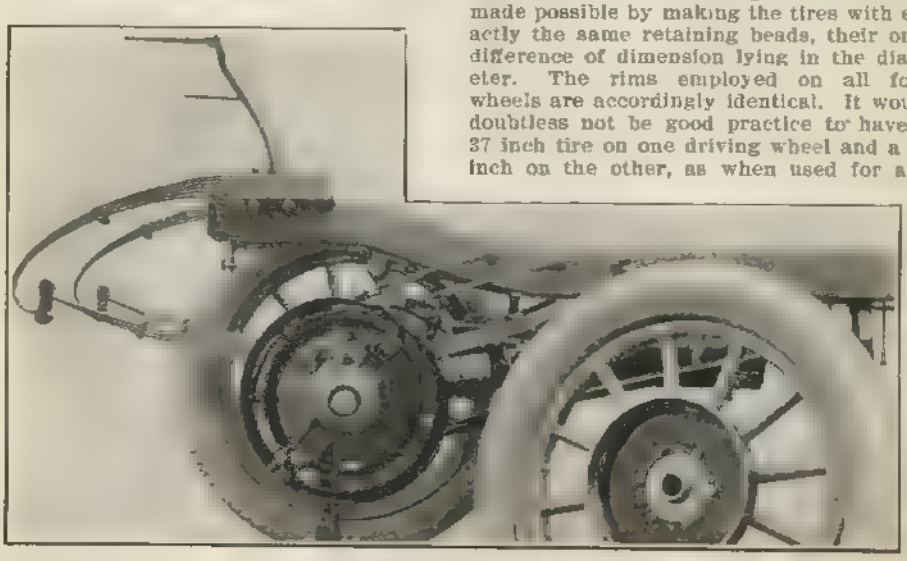


Fig. 7. View of the rear end of the 1910 Pierce chassis showing the three-quarter elliptic springs, the dropped pressed steel frame slotted to allow the brake eccentric ends to protrude, also showing the double set of brakes with the wheel and brake drum removed

length of time, this would impose too great a strain on the differential, but it would always be practical for emergency conditions.

The fulcrum end of the control levers on the steering column has only been raised 1½ inches on this model, the other changes mentioned in this connection on the 36 H. P. type having been carried out in the same manner. This applies also to the changes to the running boards, under guards and aprons, gasoline gauge, spark coils, gas tanks, steering column, thrust bearing, brake shoe pivots, and last but not least, to the fitting of the Spencer power air pump. The convenience of the latter may be appreciated when its ability to inflate the large pneumatics of this car to 90 pounds to the square inch in less than five minutes is taken into consideration. Automatic grease cups are fitted on all spring shackles, this cup being practically integral with the shackle bolt itself.

Fig. 8. Pierce 1910 front axle as now fitted with Timken roller bearings.

The luggage carrier is of the same folding type as employed on the 36, something that also applies to the divided windshield.

Due to the dropped design of the pressed steel chassis frame at the rear, the drop forged brake hanger and in consequence, the brake shoes, have been placed at an angle of 45 degrees. This gives greatly increased leverage and avoids the thrusting of the brake shoes against the drums when the springs are depressed. The gasoline feed pipe has been made with a union at each end, making it much more easily detachable.

PIERCE SIX CYLINDER 66 HORSEPOWER CAR.

In view of its size and power, this model will naturally constitute but a comparatively small fraction of the Pierce output for 1910, the first series consisting of 100 cars. While it is a continuation of its 60 H. P. predecessor of last year, quite a few minor changes have been made. The separately cast cylinders have been abandoned in favor of the twin type, thus making all three models uniform in this respect. The dimensions are 5¼ by 5½ inches. The changes mentioned in connection with the description of the 36 and 48 H. P. models, where the gear set housing, shifting lever, front axle, wheel bearings and pedals have all been carried out in a similar manner. Special steel stampings are employed for the brake drums and they have been made one inch wider, the lining being 3-16 Raybestos, as in the others.

The shifting of the front axle forward has brought about an increase in the wheel base from 135 to 140 inches. The three-quarter elliptic springs are standard for the rear suspension and the front springs have been given one inch less arch to preserve the same level. The chassis will be standard for touring, suburban and landau types of bodies, the first named being a seven passenger as last year, though the body design has undergone a change to accommodate it to the drop frame made necessary by the new type of suspension. The three types of bodies above mentioned have also been standardized so as to be interchangeable on the regular 48 H. P. chassis and 66 H. P. chassis. The steering column has been placed at an angle of 49 degrees from the vertical in all three cases, the runabout and miniature tonneau types being special in this power as well, not being designed to take any other body. They have a 133½ inch wheel base, the front axle being placed directly under the center line of the radiator. The runabout and miniature tonneau bodies for the 66 H. P. chassis have been made interchangeable on the 48 H. P. runabout chassis.

As is the case with the other models, one of the greatest changes made in the new series of cars is to be found in the liberal increase in the size of the tire equipment. On the touring car, landau and suburban types this is 37 by 5 inch front and 38 by 5½ inch rear, while for the miniature tonneau and runabout, it is 37 by 5 inch all round. All the other detailed changes mentioned in the description of the 36 and 48 H. P. chassis, such as the improved arrangement of the control levers, increased size of running boards, continuous apron from front to rear, improved design of the mud guards, adoption of the Spencer power air pump, Prest-O Lite tank, master vibrator coil set for the emergency ignition, gasoline gauge on dash, bronze bushes in brake shoe pivots, grease cups on all spring shackle bolts, have been carried out according to the same standards on the 66 H. P. chassis.

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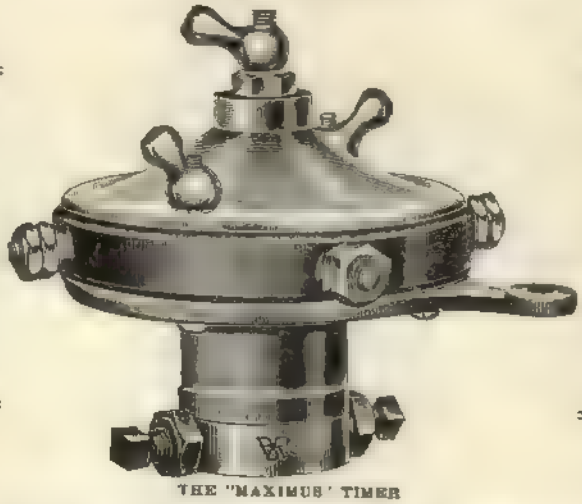

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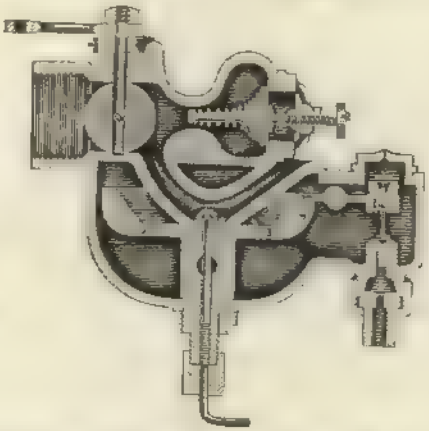

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The principal feature is the improved method of applying both the constant and compensating air. The small opening for the constant air creates a strong vacuum on the nozzle, resulting in throttling to very slow speed and ease in starting. The method of applying the compensating air does away with the sudden increased rush of air on the spray nozzle at change of throttle.

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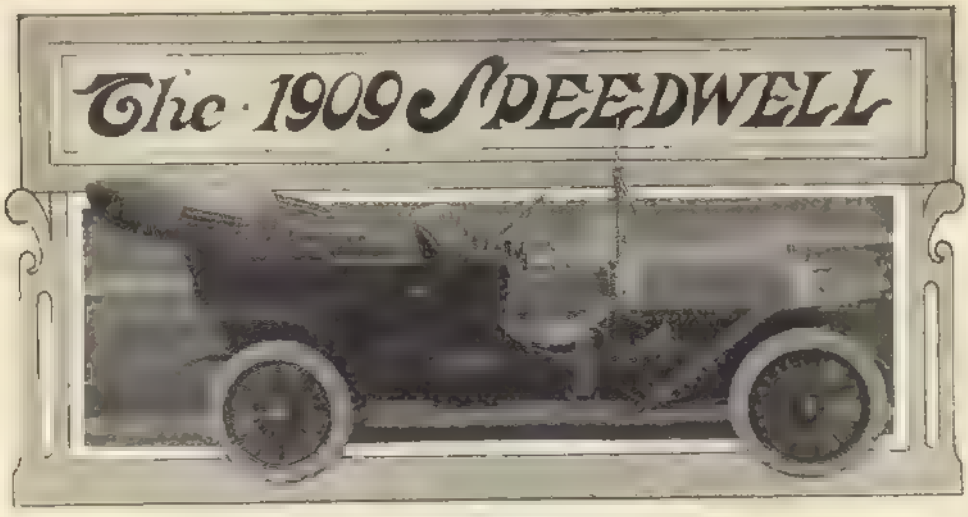
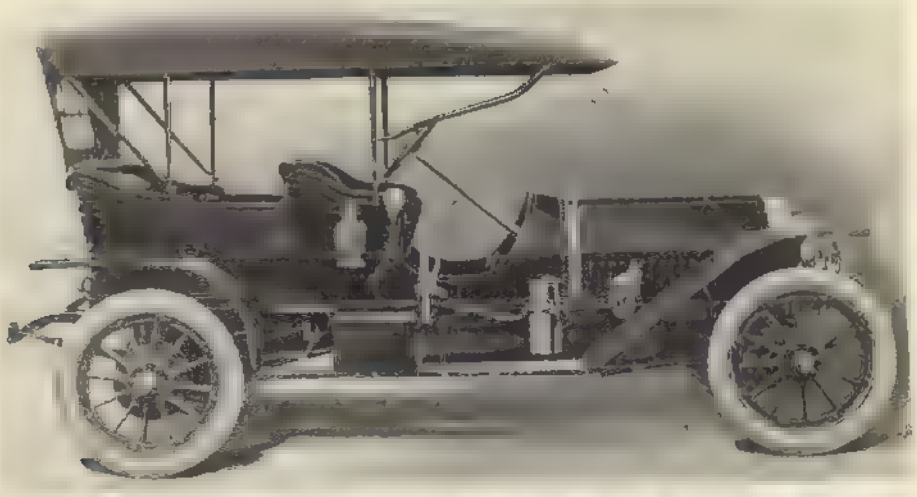



THE DOLNAR

The Speedwell Motor Car Company, Dayton, Ohio, U. S. A., began in 1907 and made and sold about 25 cars that year. Some of them 132 ins. wheel base, 6 cylinders and the remainder 116 ins. wheel base, 4 cylinder motors, $4,250.00 and $2,500.00 respective prices. In 1908 the 6 cylinders were dropped and about 100 Speedwell cars 120 ins. wheel base, 4-cylinder motors, $2,500.00, were made and sold. These Speedwell 1907 and 1908 models were designed by Mr. G. J. Loomis, an engineer of extended experience in motor car design and construction, he having held positions of responsibility in the engineering departments of some of the most widely known American automobile factories.

A 1909 production of about 400 cars was decided upon, Mr. Loomis continuing in the business as general manager, and Mr H. N. Anderson, an engineer well known in the trade from his connection with three of the more successful early American car builders, was placed in charge of the mechanical end of the business.

The company owns its 6-acre factory plot in Dayton, a suburb of Edgemont, with eight factory buildings, and will soon begin



[illegible] Wheel base [illegible] inches tires [illegible] inches motor 4 cylinders 4-cycle [illegible] style [illegible] the spare forward and [illegible] Class [illegible] Weight [illegible] part [illegible] chassis [illegible] with [illegible] wood [illegible] as [illegible] magneto mats, horn and tools. It should be noted that Speedwell cars [illegible] and the full double ignition including the Bosch magneto is furnished as a part of the regular equipment with no extra charge.

the erection of a ninth structure, 250 feet square, saw-tooth roof, glass and slate, concrete walls and floor.

The officers are: Pierce D. Schenck, President; M. L. Sternberger, Vice-President; Ralph A. Herbruck, Secretary and Treasurer, and G. J. Loomis, General Manager.

The 1909 line includes one single chassis only, fitted with a full list of different bodies, to seat from two to seven passengers and including everything in general demand. Some of the leading models are here shown and the prices of all are given.

Fig. 2. Speedwell 9 C. Roadster, in various forms [illegible] seat two, three or four passengers. Same chassis as Fig. 1 and same general body appli[illegible]. Weight about [illegible] pounds; price with any number of seats up to four, $2500.00. Folding top $[illegible] extra. Glass shield $60 extra.

Fig. 3. Speedwell 9 C. Roadster with military rumble seats. Same specifications and weight as Fig. 2. Price $[illegible].

THE AXLES

The axles are both by Timken, with everything on Timken roller bearings, even to the stub-axle load-carrying bearing. The Speedwell front axle is a steel drop forging, single piece, no weld, I-beam section, all usual practice form. The live rear axles are full floating, the rear wheels being carried on Timken roller bearings seated on outward extensions of the rear axle casing members.

These Timken rear-axle casing-sleeves are each one integral with one-half of the bevel-gear casing, each integral half being a drawn steel cup with a long tubular stem, the cup ends are notched together and welded to form the gear housing, while the tubular ends extend outward through the spring perches, brake drums and rear wheel hubs. The front of the rear axle gear-housing has an opening large enough to take in the bevel gear and the balance gear, which are assembled with the bevel pinion and its shaft in bearings carried on the cover of the gear-housing opening in unit assembly; the torsion arm eyes are integral with the bevel gear-housing cover, which may be removed after disconnecting the torsion arm and propeller shaft by taking off the cover-stud nuts, without disassembling the bevel pinion and gear and balance gear.

The drawn steel cup and tube halves of the rear-axle casing make a light integral structure when welded together which is so strong in the vertical plane as to need no truss-rod under the rear axle, and is

grease-tight as well as dust-proof. This Timken axle is made at less cost with semi-floating live axles which have the rear wheels keyed to the axle outer ends, but the Speedwell designers prefer to use the better and more costly form in which the live axles are full-floating and the rear wheels are supported on the axle-sleeve ends.

only, top three leaves banded together, spring perched revolubly on the rear axle casing sleeves and are fitted with heavy grease cups. Both spring eyes are linked to the chassis frame by links in tension, the driving wheel push being transferred to the chassis frame through struts.

The struts are steel tube bodies 1 in. out. dia., 5-32 walls, with steel eyes, front eye

Fig. 4. [illegible] 1909 Chassis. Right side elevation. The wheel base is 20 inches. The tires, standard, are [illegible] hose of the clutch fork rollers, which are on annular bearings, and the fan shaft, which [illegible] Both struts and the torsion arm are fitted [illegible] this latter member being in triangular form [illegible] worm and full circle worm gear, both hard [illegible] by Warner

THE SPRINGS

The springs are all half-elliptic, front springs under the chassis-frame sides and rear springs outside of the chassis-frame sides. The front springs are 40 ins. long x 2 ins. wide, 6 leaves, leaf sidewise retention by banding only, top 3 leaves banded together. Malleable iron bolsters are placed between the front axle spring perches and the springs. The front spring forward ends are jointed to the chassis frame eyes and the spring rear ends are linked to the chassis frame sides. The rear springs are 56 ins. long x 2 ins. wide, 8 leaves, sidewise leaf retention by banding

shanked and pinned and brazed into the body-tube front end; the rear strut eye has a threaded shank tapped into the strut rear end and retained by a hex. check-nut, to afford a screw adjustment of the strut length, which is about 42 ins.

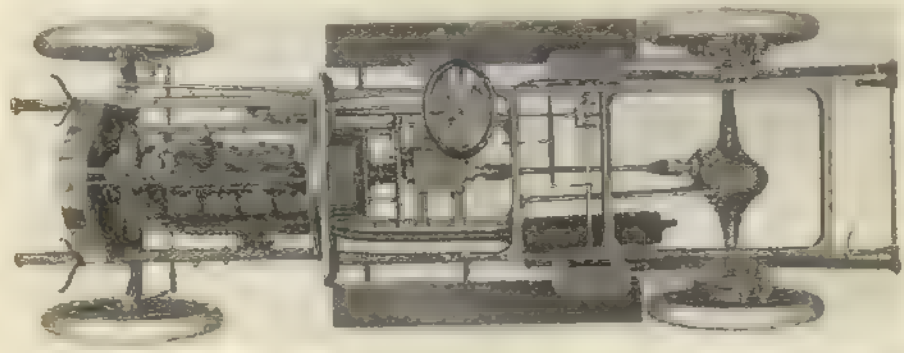


Fig. 5. Speedwell 1909 Chassis Plan. The run-boards are of wood, covered with imported linoleum. The [illegible] are of pressed steel. The front board is [illegible] The radiator is of honey-comb form, radiator brackets bolted on leather bearing pieces to the chassis frame sides top members the radiator having a single brace rod from the top to the front board. There is a double end wabbler between the clutch hub and the [illegible] shaft, and the propeller shaft [illegible]

THE CHASSIS FRAME

The frame is of pressed steel, channel sections, thickness of stock 5-32. The chassis frame length, spring-eye forward to link-eye in rear is about 169¼ ins. The frame is flat on top and is two widths, 34 ins. in rear and 32 ins. in front, side frame bends reinforced by increasing width of channel top and bottom and by the cross-

girt ends. The frame is hot riveted and has a channel section sub-frame, 3 ins. greatest depth x 1¼ ins. wide, about 74 ins. long. The chassis frame side greatest depth is 4 ins. and the width is 1½ ins.

The motor base and the change gear box are each supported at 4 points on the sub-frame.

THE SPEEDWELL MOTOR

The motor is 4 cylinders, 4-cycle, water-cooled, 5 ins. cylinder bore and 5 ins piston stroke, 45 B. H. P. The water circulation is by a gear-driven centrifugal pump The ignition is jump spark, two spark plugs in each cylinder, with magneto, dry cells and coil box, complete double igni-

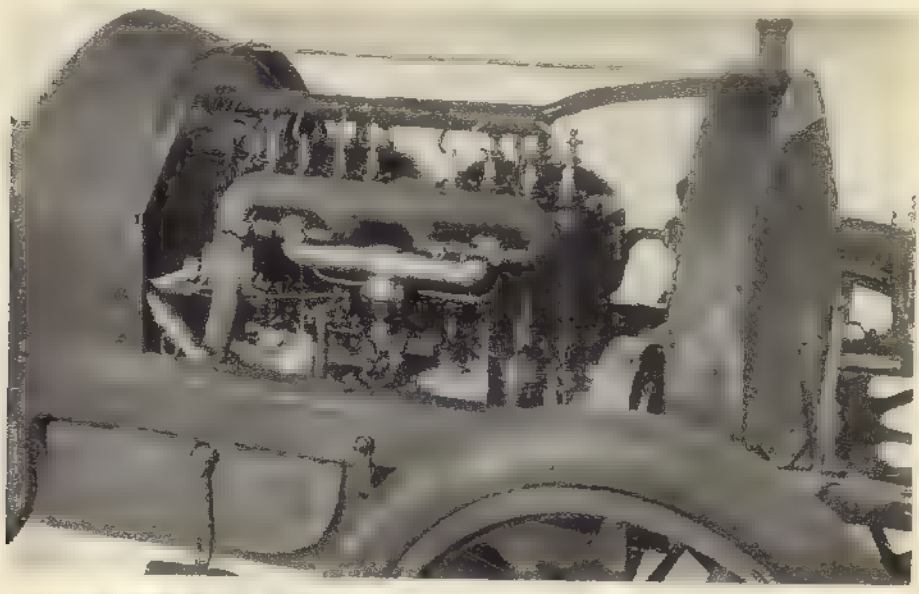


Fig. Speedwell right side of motor. The wiring is carried in aluminum tube. The exhaust manifold is cast in one piece, and has a casing cast over the camshaft bevel gear and is driven by a fiber gear and is carried by a stud. The exhaust pipe connection is shown at the rear. Note the two spark plugs in each cylinder directly over the inlet and exhaust valves. Note the complete housing by the under pan

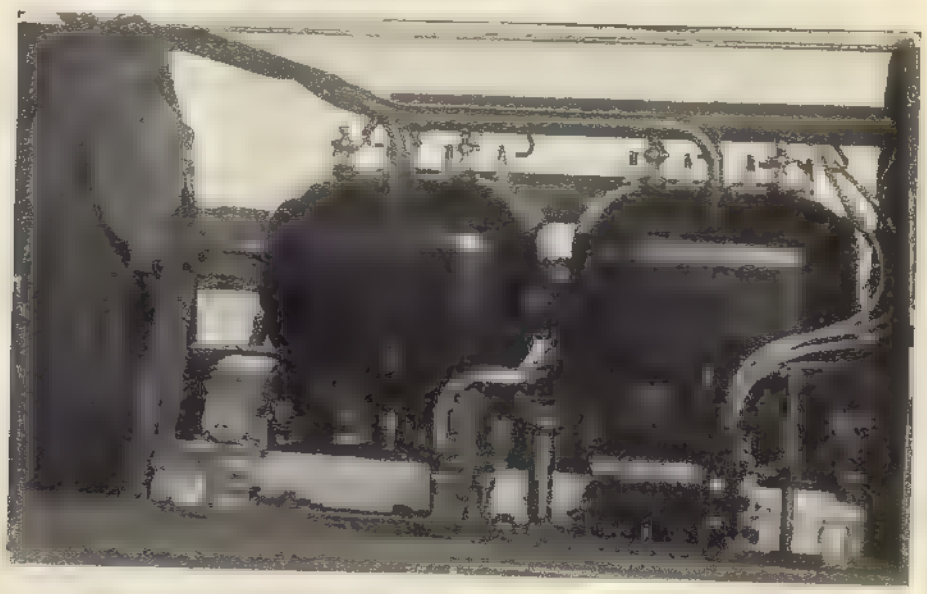


Fig. 7. Speedwell 1908 motor in chassis. The centrifugal pump and magneto are driven through an intermediate gear from the crankshaft. The camshaft is driven by a fiber gear. The water circulation is by a centrifugal pump. The magneto is by Bosch. The fan is belt driven, fan-shaft on 3 point ball bearings in an arm boss, the arm swinging to tighten the belt.

tion system. The motor base is an aluminum casting and has 4 lugs resting on top of the sub-frame. The valves and carburetor are on the right side of the motor and the pump and magneto are on the left side

CLUTCH AND CHANGE GEAR.

The clutch is an aluminum cone, leather faced, normally spring-engaged with the fly-wheel, with a short universal shaft having hardened wabbler joints between the clutch hub and the front end of the gear-box line shaft.

BRAKES

Each rear wheel hub carries a pressed steel brake-drum 14 ins. out. dia. x 2½ ins. internal face. The internal shoe is a flexible ring, expanded by a wedge and rocker-arm action. The external band is contracted by a 3-hole lever action with adjusting screw and wing-nut linkage for exterior-brake friction-adjustment. Both brake rings are fibre-faced. The internal brake, enclosed by the brake-drum cover, is the ordinary brake, and the exterior brake, exposed, is the emergency.

Fig. 8. Speedwell 1909 Chassis Control. There are two outside hand levers, two large pedals and a plunger [illegible] The brakes are applied through eyepers, one of which is shown. The clutch is an [illegible] deg. angle leather faced. In normal engagement by the 400 lb thrust of a coiled spring. The [illegible] ish'd support is applied to the [illegible] boards of the machine and help to [illegible] cars only

The speed changes are by selective sliding gear, side-shaft below the line-shaft, all gears hardened, line-shaft and side-shaft on Timken roller bearings, three forward speeds and a reverse. The gear box is an aluminum casting, supported by 4 lugs resting on the sub-frame sides

The propeller shaft is of steel, 1¼ ins. diameter, with hardened universal joints at each end, in dust-proof casings.

MOTOR LUBRICATION

There is an oil reservoir below the crank-pits, oil is forced from the reservoir to high level whence it descends through three unobstructed oil leads to the three crank-shaft boxes, overflowing to the four crank-pits. The lubrication is by splash for the rods, pistons and cylinders, and the oil overflow from the crank-pit dams returns to the underneath oil reservoir.

SPEEDWELL CONTROL

There are two hand levers at the driver's right, the outer one, latched, being interlinked with the clutch rocker so that when this outer lever is pushed forward it first disengages the clutch and then applies the rear hub drum, emergency, exterior brake bands. The inside gear shifting lever has 5 positions in 2 slots, and is not latched against inadvertent reversing.

Of the two large pedals, that at the right when pushed forward applies the internal ordinary brake expanding bands to the rear-hub brake-drums. The left large pedal when pushed forward disengages the clutch through a rocker and two arms which carry ball bearing rollers in the clutch hub groove, making easy work for the foot. A small pedal opens the muffler-cut out valve

when depressed. An accelerator pedal is fitted to order only

ON THE ROAD

Tuesday April 29th, a 1909 Speedwell chassis with tester's body, decked in rear and having at the start 12 gallons of gasoline and three oil lamps, left the Speedwell factory, Dayton, Ohio, at 4.11 P. M., E. D. Holtzmuller, driver, and the writer, front seat observer. The seats were upholstered and gave a fair hand-hold on the edges. The car was very lively with only 3070 lbs. total weight and 20 inches collective piston diameter, and the rear tires took hold of the road with a propulsion effect that was very noticeable, when Holtzmuller gave a good wide throttle opening at the start on the rough clay road that leads from the Speedwell factory towards the National pike. The observer's seat was largely atmospheric over this first short stretch of clay ruts and bumps, and when we turned the first short corner at 50 miles or so, and the hind wheels went sliding over ten or twelve feet towards the large radius side of the curve, the observer remarked to the driver that slowing down at turns was the better practice, but he said we could make better time by keeping the brakes off. But there was no fault to find with Holtzmuller's driving, as he is all at home on the Speedwell, has a good eye and sees the road a long way in front, and besides thinks quickly, decides promptly and always has his head with him. As soon as we struck the pike the driver put the car at about 54 miles, which seemed like a hundred because of the strong wind blowing in our faces. The day was sultry and cloudy, with some new leaves showing in the woods and the pink blossoms on the peach trees, and when the driver, who wanted to make a good speed showing, finally held the car at about 50 maximum, the rush through the fervid summer air became exhilarating in spite of the bumps in the road

Our route was West Alexandria, Eaton, Greenville, West Milton and Dayton return. At Eaton we stopped four minutes to be weighed on warehouse scales, at Greenville we stopped two minutes to estimate our gasoline supply, and at West Milton we stopped eight minutes and took on five gallons of gasoline which we did not need. When in Dayton, returning, we were held up fifteen minutes at a railway crossing, reached the factory at 7.20, and there drew 7½ gallons of gasoline out of the tank. The whole run was sealed-bonnet for the motor, which always started on the spark. A small dog tried to cross the road in front of us, coming out of Greenville, and our left front wheel terminated his first bark before it was more than well begun. Holtzmuller's cap blew off early in the run and he remarked that he didn't need it, and kept on undisturbed. The tester's body had a sloping hinged deck, covering our tools and spares. This cover was retained by spring catches and in addition was wired down before leaving the factory. We missed this cover after leaving West Milton, and at the same time observed that our tail lamp had deserted us. Holtzmuller thought we were also an inner tube short, but presently found the missing article hanging on the rear spring rod. The observer firmly believed that he saw the front wheel on his side—the car had no mud guards—leap 6 feet in the air at one high bump, and also saw the front axle break in two at the same time, but as the car ran right along at about 55, this incident must have been incorrectly noted by the said observer's eye.

The car and passenger weight was 3070 lbs., scale, miles run 103, Blue Book, running time 160 minutes, average time per mile 1.55 minutes—1 min. 33 sec., the average pace was 38.7 miles and the total fuel consumption was 9½ gallons, which is about 10.8 miles to the gallon. All of this is very good indeed, the miles per gallon being well up in best company figures, considering roads, wind and speed.

The Speedwell cars carry their passengers very easily in regular bodies with regular loads, but this car did not have a regular body nor a regular load, and the observer cannot truthfully say that he sat calmly and wholly undisturbed in his seat throughout the whole of this very fast, rough-roads run.

## GRAND CENTRAL PALACE SHOW TO OPEN NEW YEAR'S EVE

Opening the Grand Central Palace Show of the American Motor Car Manufacturers' Association on New Year's Eve, proved so successful last winter, that the Show Committee, of which R. E. Olds is Chairman, has decided definitely upon that date as the time for the opening of the Decennial Show of 1910. There will be the usual private view in the afternoon of Friday, December 31, 1909, with the formal opening at 8 o'clock, on New Year's Eve, the show continuing until the following Friday night.

The Cameron Motor Company, organized last fall with New York capital to control the output of Cameron cars from the factories at Beverly, Mass., and New London, Conn., has been absorbed by the old company. The capital of the Cameron Car Co., of Beverly, Mass., has been increased to $500,000, and the affairs of the enlarged organization will be handled by E. S. Cameron, general manager; W. T. Marsh, treasurer, and H. W. Doherty, sales manager. Arrangements are being completed for an output of 5000 cars between September 1, 1909, and July 1, 1910.

# The Oakland 40 F

The Oakland Motor Car Co., of Pontiac, Mich., manufacturers of the Oakland gasoline cars, have added to their 1909 models an entirely new car known as the Oakland 40 F., which is herewith illustrated and described

This new machine is of the 4-cylinder variety, shaft driven with sliding gear change speed and is peculiar both in its method of unit assemblies and mounting of these units. The peculiarities of construction are at once seen from the plan view of the chassis, Fig. 2. It will be noticed that there is an entire absence of cross frame members betwen the rear of the engine and the rear of the frame, and joint is also a slip joint, thus taking care of the fore and after motion, of the rear axle and transmission assembly, forward end, due to the action of the springs.

The fly-wheel is of unusual large diameter, thus giving a maximum amount of fly-wheel energy with a minimum amount of weight. The hub of this fly-wheel contains hardened steel tubes in which are seated the hardened balls of the sliding universal joint. It is claimed that this joint is so constructed and has sufficient bearing surface that wear on the joint is practically negligible.

The motor is tilted downward at the rear, giving a perfectly straight line drive.

The Oakland 40 F. This new Oakland model has a 4-cylinder, 4½x5 motor, shaft drive, three point power [illegible] three speed [illegible] which is combined in a single housing with a main [illegible] rate off. This housing is rigidly attached to the for [illegible] rear axle assembly and is supported only [illegible] tubular housing tube, thus forming a part of the rear axle assembly and is supported only [illegible] on a sliding universal joint in the center of the fly wheel. Details of the construction given [illegible] Wheel base 11[illegible] tread 56 in., semi-elliptic front springs, full [illegible] rear springs fitted with reboun[illegible] clips. Tires 34x4, two sets of brakes on rear wheels.

that the sliding gear change speed mechanism thoroughly housed, is not supported either on a sub-frame or on the usual cross frame members. An examination of the construction reveals the fact that the transmission, propeller shaft housing tube and the rear axle assembly form a single unit as in transmission rear axles, but in this case the change speed mechanism is at the forward end instead of in assembly with the rear axle differential housing This unit assembly is supported at three points, the front end being flexibly mounted in the center of the fly-wheel, while at the rear the axle is, of course, connected to the frame through the rear full elliptic springs. By this construction the raising and lowering of the driving wheels has no effect on the propulsion of the car and any side twist is taken care of in the same manner making the car, as to this portion, one of the most flexible of those on the market. The forward end of the change speed gear case is supported in the center of the fly-wheel on a specially designed universal joint with ball ended arms of large surface. This universal

The claim is made for this construction that the weight at the forward end of the transmission overcomes the upward tendency given it in driving the car forward. It is also claimed that the sliding universal joint takes care of the shock in starting and in hitting obstructions in the road.

### THE ENGINE

The 4-cylinder motor is of the company's own design the cylinders being 4½x5, cast in pairs, with interchangeable intake and exhaust valves on the same side. The main engine bearings are specially large, being 4½ ins. in length by 1¾ ins. diameter, while the rear bearing is 6 ins. in length. The big end connecting rod bearings are 3 ins. in length. This motor is mounted at the forward end on the middle of the front cross member and at the rear on a cross member strongly webbed, which rests directly on the side frame members, thus giving the motor a 3-point suspension or flexible mounting. The crank case is of aluminum cast in one piece. All of the crank-shaft bearings are of babbitt formed in a specially constructed removable cast iron bushing.

# Splitdorf Ignition

MAGNETO ignition is now universally admitted to be the most powerful and reliable method in vogue today. It has attained this recognition only after exhaustive tests by the leading engineers in the combustible engine field throughout America and Europe. The natural result of this proof is found in the numerous forms of Magneto ignition now on the market.

There has existed in this country an impression that the imported Magneto, being higher in price, is higher in quality.

We are producing a Magneto made by American workmen, in an American factory and at an American price that equals in every way and excels in many the workmanship and operation of anything produced in the foreign market. The fact that the Magnetos of our manufacture will operate at such a slow speed, thus enabling the user to get away from the compulsory use of battery ignition, and at the same time have a Magneto that will "stay put," proves that we have attained our object.

The additional fact that the Splitdorf Magneto is the most popular one of the day, and that the Splitdorf Ignition output for 1910 will be the largest in the world, further proves our position.

We make this assertion because we realize that the owners of automobiles and kindred interests are rapidly joining that discriminating class who demand actual proof before purchasing, whereas in the past, with but a limited knowledge of the elementary principles entering into the construction of machines of this nature, they were compelled to form their judgment more or less from plausible advertisements.

In the description of our Magneto, which we herewith present, we endeavor to explain the principles of construction and method of use in plain words so that it may be easily understood by the lay mind as well as by the experienced engineer.

That these instructions may be better understood, a simple explanation of the system employed and a line cut showing a cross section of the standard type B machine is here given.

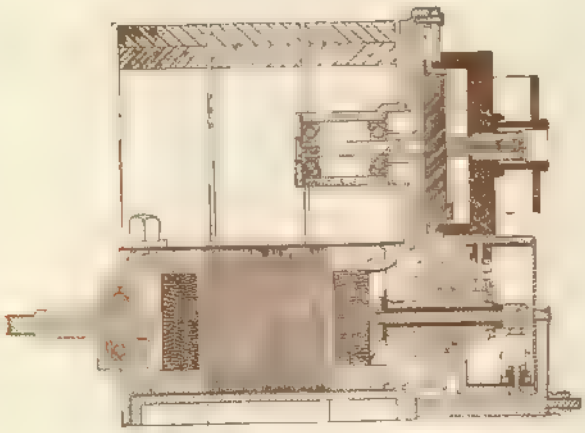


*Fig. 1.* Cross Section Model B Magneto.

The system used is that having an armature with but one winding and giving a current of comparatively low tension. The current is discharged through a transformer having a low and a high tension winding somewhat similar to a regular spark coil. This steps the current up to a voltage sufficiently high to enable it to jump the necessary gap between the points of a spark plug in the compressed mixture in the cylinder of the motor.

Looking at the cut of the machine one can almost take in its general construction at a glance. The plain H or shuttle armature is mounted between two annular ball bearings. One end of the shaft is the driving end and the other is equipped with the breaker cam and the insulated plug which delivers the current generated in the armature to the collector brushes from which it goes to the transformer connection.

From "A' the armature current goes through the primary of the transformer, and the circuit being broken at the proper moment a very high voltage current is induced in the secondary winding of the transformer, and being delivered to the heavily insulated cable D (see wiring diagram) is conducted to the central brush of the distributor whence it is delivered to the spark plugs in the different cylinders in correct sequence.

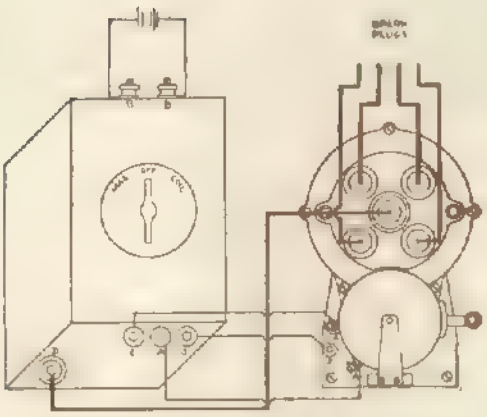


*Fig. 2.* Wiring Diagram for Model B and Model D Magnetos, with Non-Vibrating Dashboard Type Transformer.

In addition to using the current from the Magneto we have adapted the transformer to be used as a spark coil by using the breaker mechanism of the Magneto as a circuit breaker to interrupt a current from the battery, which can be switched in for starting purposes or for an emergency. The distributor is used to deliver the current thus generated to the spark plugs. This gives a dual system with one set of spark plugs, and the simple movement of the switch controls both systems.

A change in style of building automobiles shows a dash board free of coils and general appurtenances. To meet this condition we have devised a transformer which admits of its being strapped to the frame of the car or to the under side of the foot boards or any other convenient place out of sight. This transformer is in the form of a tube with the necessary connections grouped at one end. It is waterproof and oil proof, and is becoming a very popular piece of ignition apparatus. We show herewith a separate wiring diagram for this apparatus, and it is possible to use this new device in connection with any model that we make.

# Instructions for Setting and Operating Model B.

After bolting the Magneto to the prepared base on the motor, crank it until cylinder No. 1 is exactly on its firing center (i. e., the point of greatest compression). The motor must remain in this position until the balance of the work is finished.

Retard the spark advance mechanism at the steering wheel to its limit and connect it to the spark advance lever on the breaker box of the Magneto, so that if the Magneto shaft revolves in a clockwise direction looking at the driving end, the breaker box lever will be at its topmost position. If the shaft revolves left-handed the lever should be at the bottom limit, and advanced upward.

As all four cylinder four cycle models run at crank shaft speed it is customary to drive either geared direct to the crank shaft or by means of a universal coupling known as the "Oldham" coupling. The latter method is very much to be preferred to the former, because the accurate setting and alignment absolutely necessary with the direct gear on the armature shaft is not essential with the latter method. There is another drive possible, the chain, but on account of the many wearing points, back slack, etc., this should only be used where gear drive is impossible on account of inaccessibility, or where a large number of gears are objectionable.

*Fig. 3*

If the "Oldham" drive is employed, the driving flange is first slotted to fit the "Woodruff" key supplied with the Magneto and then fitted. The other flange of the coupling is left loose on the end of the pump shaft or other shaft used to drive the Magneto and the cross block is slid into place.

Now revolve the armature shaft in its direction of rotation until the oval breaker cam comes in contact with the roller in the breaker bar and just begins to separate the platinum contacts.

*Fig 4.*

The flange of the coupling can then be drilled and reamed for a taper pin and the timing of the Magneto is then permanently effected.

Then connect the terminals on the Magneto to those on the transformer as shown in the wiring diagram.

The wires to the spark plugs in the cylinders should be "stripped" for about one half inch and the ends pulled into the cups of the distributor, and jammed up into a little ball as illustrated.

*Fig. 5.*

After ascertaining the position of the bronze sector of the distributor, connect the cup directly over it to the spark plug in cylinder No. 1.—Since the direction of rotation of the distributor is always opposite to that of the armature shaft, the wire from the cup next in rotation goes to the next cylinder in sequence of firing and so on until all four are connected. Four cylinder four cycle motors always fire either 1 2 4 3 or 1 3 4 2, the latter being the most general rule.

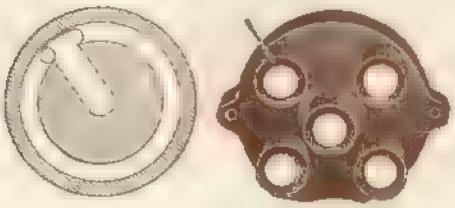


*Fig. 6.*

In starting the motor, always retard the spark mechanism to its limit, throw the switch on the transformer to the side marked "Battery" and crank the motor.

If it is desired to start on the Magneto side, ignoring the battery entirely, advance the spark mechanism about one half or two-thirds of the way and crank as before. No back kick is observed. DO NOT DRIVE THE MOTOR WITH THE SPARK RETARDED, BUT AS FAR ADVANCED AS THE ENGINE WILL PERMIT.

*Fig. 7.*

It sometimes happens that parties ordering these Magnetos are unable to give us the direction of rotation, and we have, therefore, designed them so that by following these instructions anyone can set them to run clockwise or counter

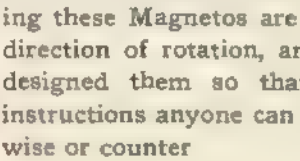



*Fig. 8.*

Thus if the breaker cam is put on with the side marked "R" out, the armature is to revolve right-handed or clockwise looking at the driven end; if the "L" mark is out, it is to run counter or left-handed.

To change from one direction to the other, remove the breaker box, hold the driven end of the armature firmly with a pair of gas pliers and remove the little nut. Pull off the cam which is keyed on with a Woodruff key, turn the cam over, replace the nut and reset it on the shaft with a prick punch so that it will not jar off. Then remove the distributor block and take out the screws from the lettered ring. Remove the brass protecting cup on the distributor bearings which will be found inside the ∩ formed by the magnets and remove the top screw found underneath in the center of the distributor shaft. The distributor and its gear can then be pulled forward out of mesh.

*Fig. 9.*

A prick punch mark will be found on the armature gear and two sets of two prick punch marks will be found on the distributor gear, one set marked "R' the other "L." The armature gear mark must slip in between the desired mark and the parts all replaced as before. The machine will then be ready to be placed in operation on the motor in the desired direction. The cam and distributor marks must be both alike, either "L" or "R."

Remember! This system absolutely requires that both poles of the battery be brought to the transformer. YOU MUST NOT GROUND THE BATTERY.

If the platinum contacts after much usage become pitted so that a bad contact results, they can be filed flat with a fine file, taking care not to file off any more than is necessary. Then reset the screw so that the break is no more than a thick piece of tin, say 1-32 of an inch.

We manufacture a number of models suitable for different sized motors having a varied number of cylinders, and we designate them by the letters B, D, G, S, SS, L, etc.

For two cycle motors of the two and three cylinder sizes our standard B, D, S and SS Magnetos, with a slight change in the distributor device, are supplied and designated, as follows: For two cylinder two cycle Model D Special and Model B Special, for three cylinder two cycle Model S Special and Model SS Special, depending on the size of the engines and the amount of space available to attach same. These Magnetos sell for the same price as our standard Models. Wiring diagrams furnished on request.

# MODEL B.

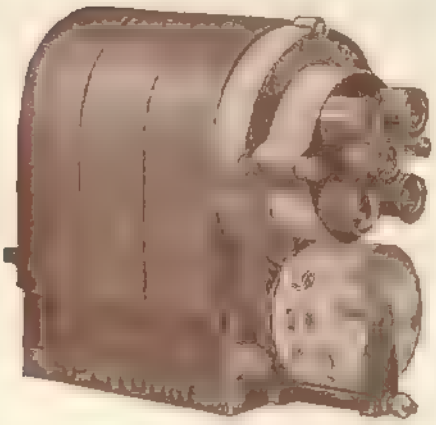


*Fig. 10.* Model B.

The standard type for heavy slow moving four cylinder four cycle motors. It has six magnets in three pairs, and is equipped with either the plain non-vibrating transformer or with one of our noted synchronized vibrators which operates when the switch is turned in the indicated direction. The vibrator type necessitates an extra lead and insulated breaker blade, equipped with platinum points, which is operated by the breaker bar.

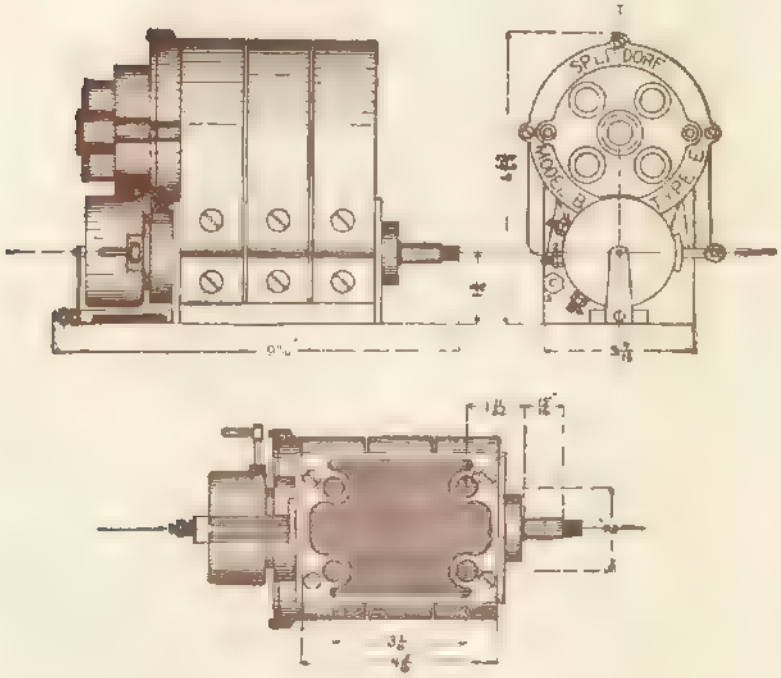



*Fig. 11.*

Model B, $150 Complete.

# MODEL D.

*Fig 12.* Model D, $125 Complete.

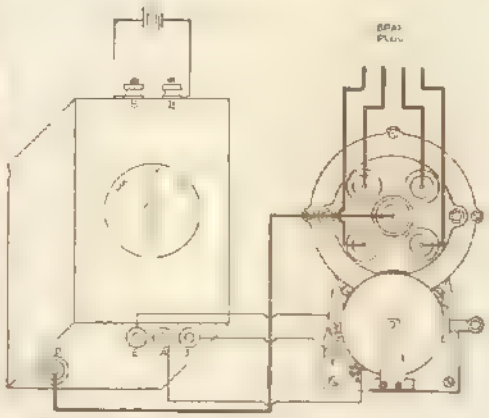
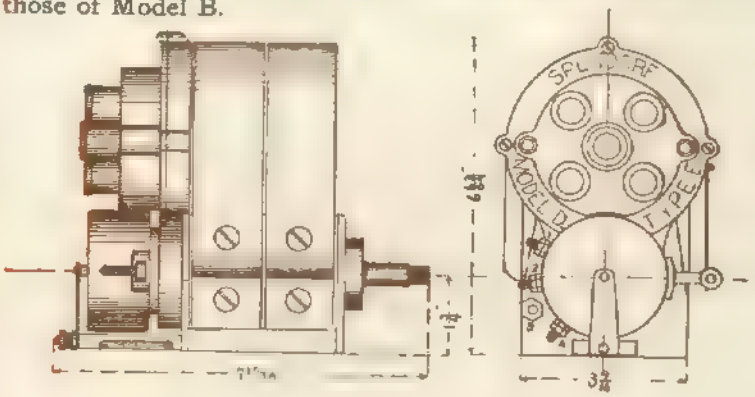


*Fig. 13.* Wiring Diagram Model D Magneto.

This model has been developed for use on four cylinder cars having small motors, especially where room is limited. It has four magnets in two pairs and is essentially similar to our Model B in most of its parts. The non-vibrating type of transformer, only, in either the dash or tube form, is used with this model.

The instructions for setting and operating are precisely the same as those of Model B.



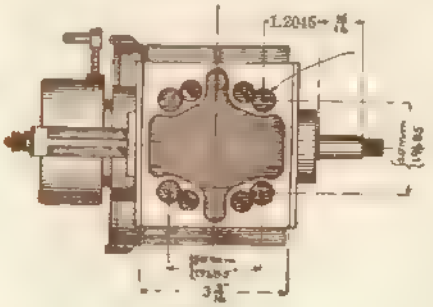



*Fig. 14*

Model D, $125 Complete.

*Fig. 15.* Model G, $100 Complete.

## MODEL G.

This Model is suitable for all motors having two cylinders firing at 180 degrees apart. (All double opposed horizontal motors and all vertical motors having cranks set together are fired in this manner. Vertical motors whose cranks are set opposite fire at 90 degrees and a Model D is necessary, as it has a distributor of which two of the points can be grounded).

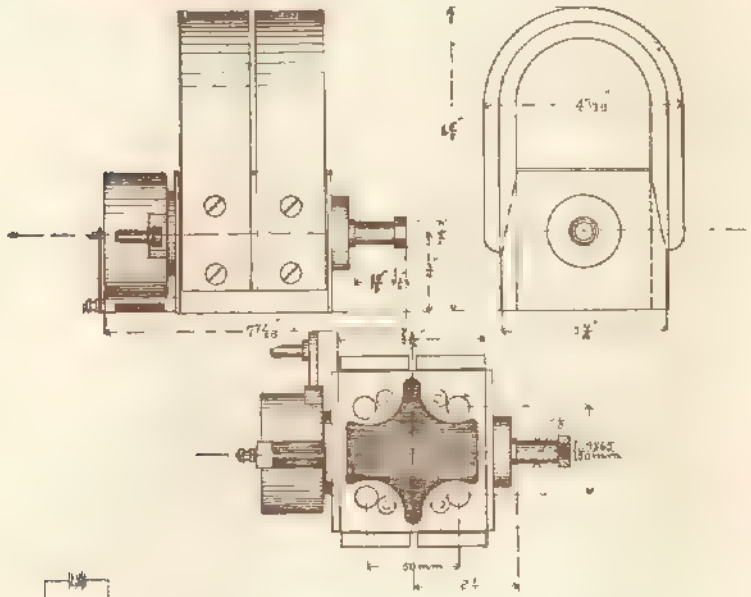


*Fig. 16.*
Model G, $100 Complete.

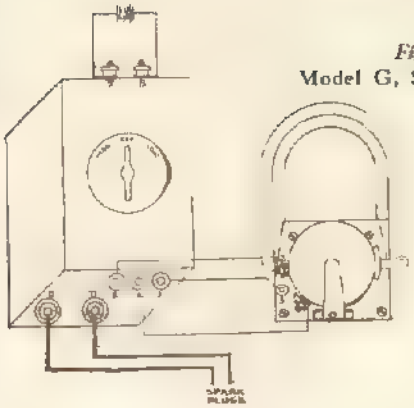


*Fig. 17.* Wiring Diagram Model G, with Dash Non-Vibrating Transformer.

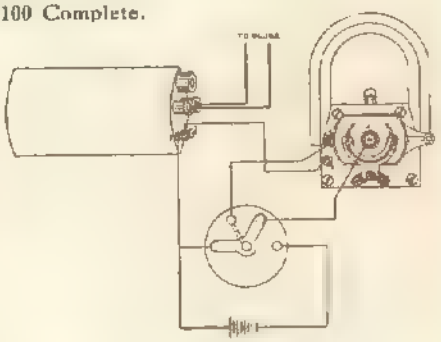


*Fig. 18.* Wiring Diagram Model G, with Tube Transformer.

# MODEL S.

*Fig. 19.* Model S, $150 Complete.

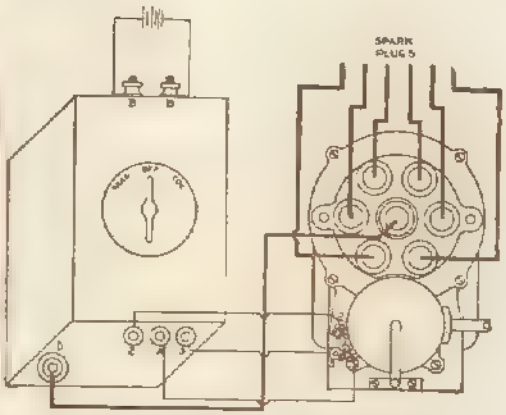



*Fig. 20.* Wiring Diagram Model S or SS.

This Model is suitable for light four cycle motors having six cylinders. It has four magnets in two pairs.

The instructions for installing and operating are similar to Model B, except that it must be driven one and one half times the speed of the crankshaft.

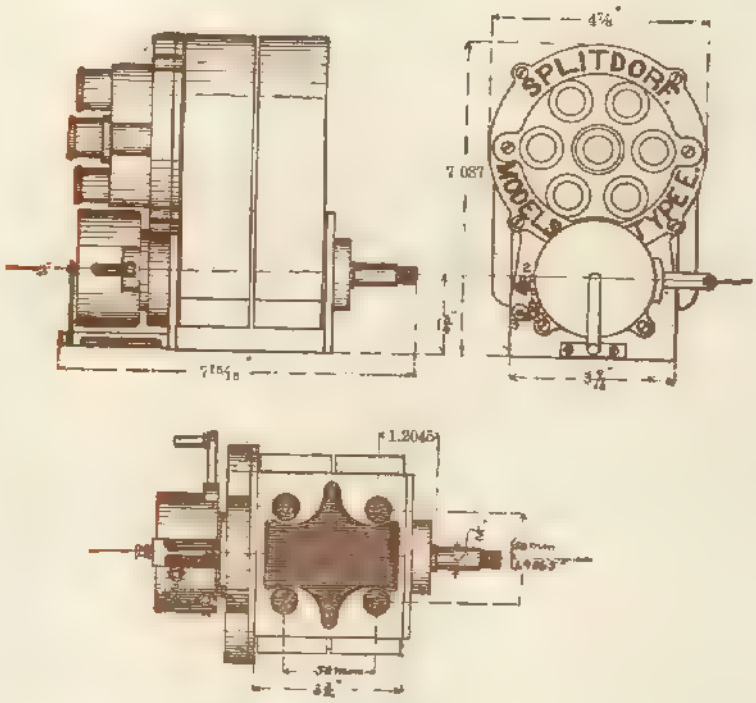



*Fig. 21*

Model S, $150 Complete.

## MODEL SS.

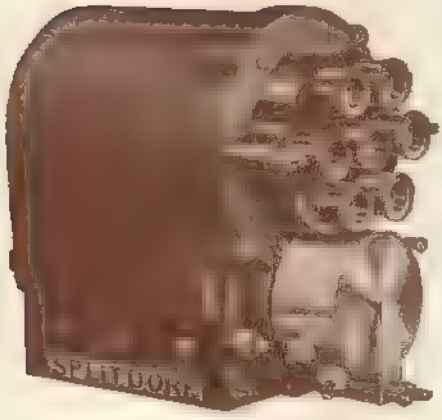



*Fig. 22.* Model SS, $160 Complete.

This Model is precisely the same as Model S, except that it has six magnets in three pairs and a longer armature and pole pieces, and is especially adapted for heavy, slow-moving motors.

The instructions for installing are exactly the same as for Model S, this machine simply being larger and more suitable for large, heavy cars having slow-moving motors.

The Tube Transformer (Figure 29) is furnished with this Model as an option instead of dash Transformer.

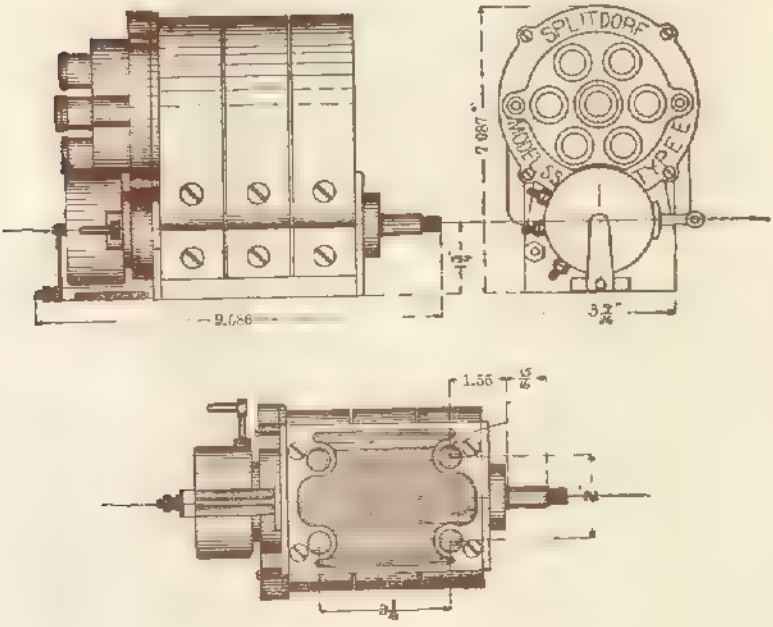



*Fig. 23.*
Model SS, $160 Complete.

*Fig 24.* Non-Vibrating Transformer.

*Fig. 25.* Vibrating Transformer.

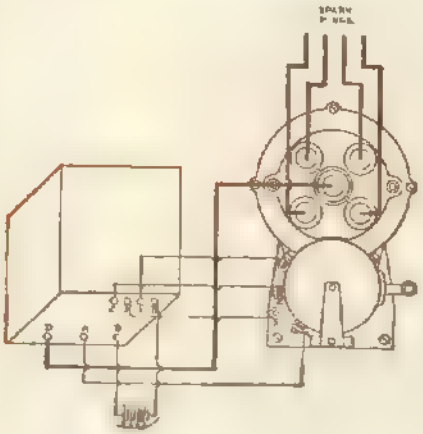


*Fig. 26.* Wiring Diagram Model B Magneto with Vibrating Transformer.

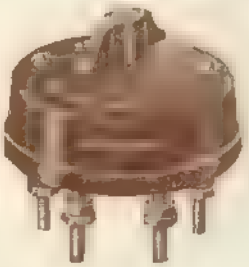


*Fig. 27.* Switch.

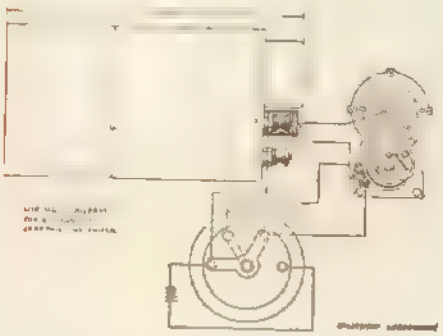


*Fig. 28.* Wiring Diagram for Tube Transformer Without Vibrator, Switch only Appearing on Dash.

*Fig. 29.* Tube Transformer.

## MODEL L.

This Magneto is exactly of the same material and workmanship as the foregoing Models. It has annular ball bearings and can be used for all low tension work. It will operate any number of cylinders, and can be driven either right hand or counter. It is driven at crankshaft speed for four cylinder four cycle motors.

*Fig. 30.* Model L, $50 Complete.

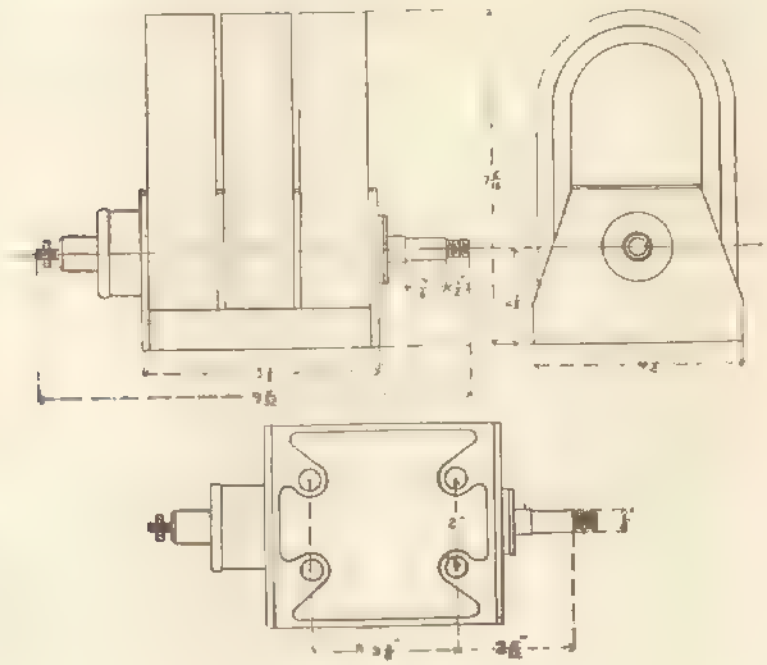


*Fig. 31.*
Model L, $50 Complete.

## GUARANTEE.

We guarantee our product to be free of all defects in material and workmanship for one year from date of purchase, but we do not guarantee against misuse, wilful neglect or bad installation.

We will replace any defective parts when presented at our factory, transportation charges prepaid, 261, 263, 265 Walton Avenue, New York, or at any of our regular branches.

Don't test your Magneto unless you have it completely assembled, i. e., breaker box in place and distributor cover with wires attached.

Don't think it necessary when washing the car to flood the Magneto with water. All high tension instruments work better when not flooded with water This will be thoroughly appreciated by those who have driven with the old type coil ignition.

Don't open up the spark plug gaps nor permit them to burn themselves open more than 1/32 of an inch.

Don't flood the breaker box when oiling the little roller on the breaker bar. The oil should be applied with a toothpick about once a month.

Don't expect your Magneto to operate if you permit the frayed ends of your wires to come in contact with each other or the metal parts of the instrument.

Don't dissect the instrument to see what makes the wheels go around, unless you are an expert. We put the right number of wheels inside when we make it.

Don't drive the motor with the spark retarded, but as far advanced as the motor will permit.

Don't leave your switch turned to battery over night. Be sure it is in the "off" position.

Don't try to improve the adjustment of the platinum points in the breaker box. This means a cool motor unless they are less than 1/32 of an inch.

Don't disconnect the wires leading from the Magneto to the coil, unless you are careful to get them back according to their respective letters. Crossed wires mean burned out connections.

Don't pull out the carbon brushes in the distributor because you think there is not enough tension on the springs.

Don't fail to put back your wire gauze brushes in the breaker box when putting the breaker box back on the magneto. Do not smash them over.

Don't pull out your switch plug until after you have placed your switch on the off point.

## IMPORTANT!

All moving parts of our Magnetos are equipped with the finest type of annular ball bearings which we pack in grease while assembling. Nevertheless we have placed an oiler at each end of the armature shaft, and it will do no harm to put a drop of oil in the oiler, say once a month. Some of our Models do not have these oilers, in which case it will not be necessary to apply any oil.

N the following pages we give a brief description of the 1910 line of The Maxwell. As in former years the cardinal and distinctive features of Maxwell construction have remained practically unchanged. An increasing adoption of these principles by other manufacturers proves perhaps better than anything else, that Maxwell design was correct in the beginning.

On the other hand, our 1910 output is marked by the addition of a few refinements that have been dictated by the trend of fashion. In consequence wheelbases have been lengthened, wheel diameters increased, magnetos added, etc. But the fundamental principles of Maxwell construction are the same; they are in themselves the best guarantee that Maxwells are the best and most usable cars made.

---

We have reached our goal, and are onward again. For five years we have worked, labored, striven, to possess ourselves of the best facilities for automobile manufacturing. We have accomplished it.

Our manufacturing facilities are recognized to be the most complete and most extensive in the world.

We have been too busy to daydream, too busy to speculate, too busy to spend any time in verbalizing the phantoms of hope; we have been too busy manufacturing a product, that has been the largest, with one possible exception, in the world, and would admittedly have been the largest if we could have filled our orders.

In 1910 we expect to make and market the greatest number of motor cars ever turned out by one organization. Perhaps 30,000; surely 20,000 within the next 14 months.

It is always our firm resolve to make the Maxwell the honestly good; the really high grade; the aristocrat among the medium-priced cars.

Our policy is, quality—the best; quantity—the largest; treatment—the fairest; value—the greatest.

Write us.

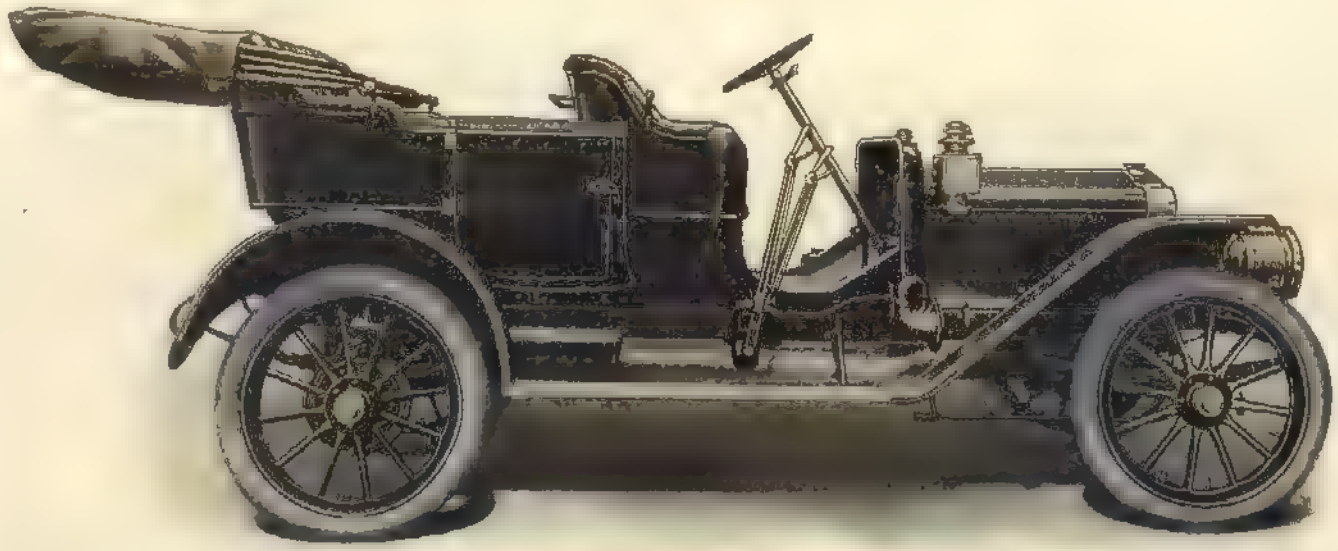
Benj. Briscoe
*President.*

**MAXWELL-BRISCOE MOTOR CO., TARRYTOWN, N. Y.**

# "Maxwell"

## MODEL E, TOURING CAR

Roomy, powerful and of dignified appearance. The doors are wide. The tonneau gives utmost comfort. Every line of the car spells ease and relaxation.



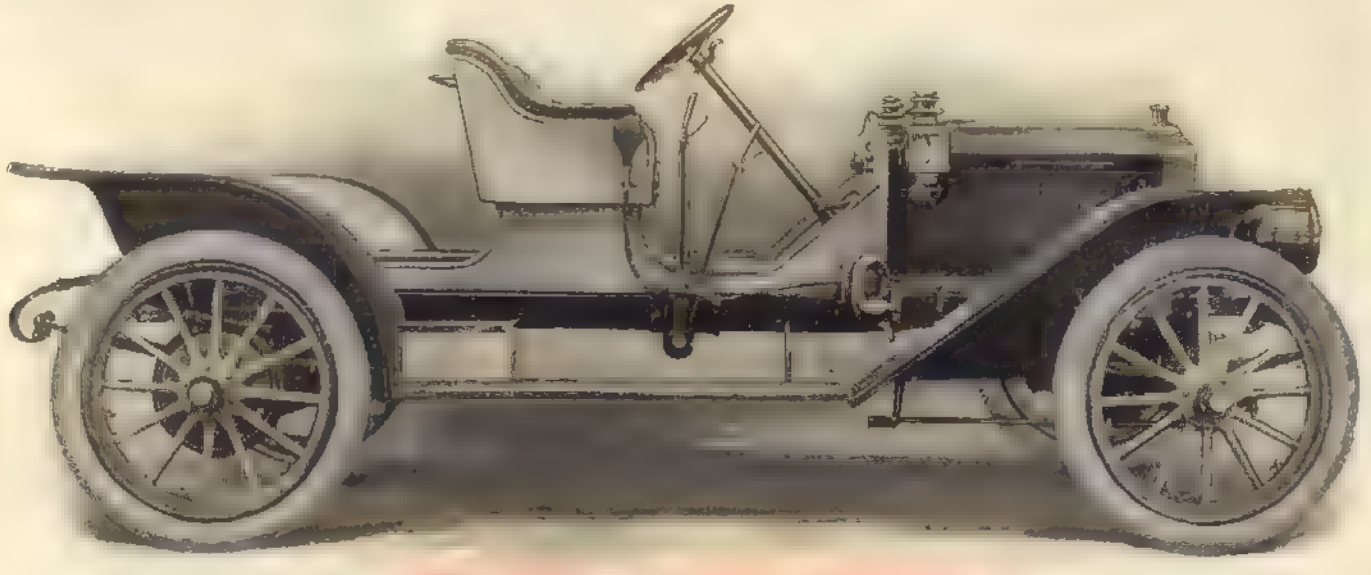
### FOUR-CYLINDER, THIRTY HORSEPOWER

MOTOR—4¼ x 4¼ inches. IGNITION—Double, Magneto and Battery. TRANSMISSION—Sliding-gear, three speeds and reverse. WHEELBASE 108 inches. WHEELS—34 inches. TIRES—34 x 4 inches. SPRINGS Half elliptic in front; three-quarter elliptic scroll in rear. PRICE $1,500. Top extra.

# "Maxwell"

## MODEL G, ROADSTER

The rear deck will accommodate spacious touring trunk. If desired, a regular tonneau will be furnished which can be quickly attached or removed. Price of tonneau, $75 extra.



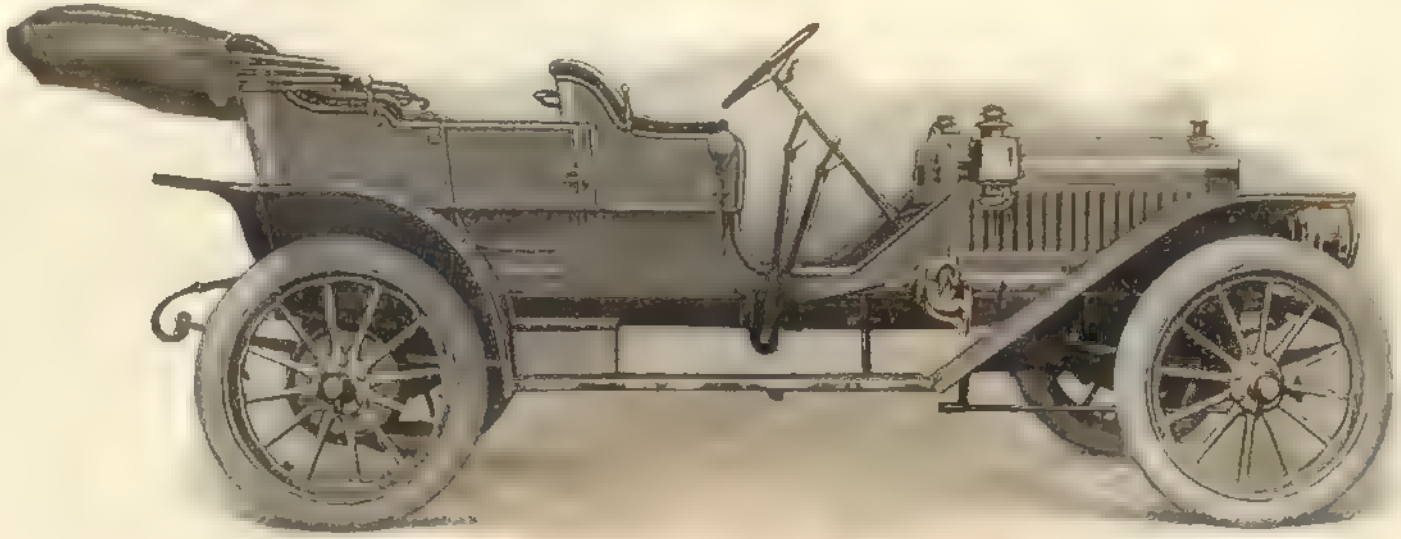
FOUR CYLINDER, THIRTY HORSEPOWER

MOTOR—4¼ x 4¼ inches. IGNITION Double, Magneto and Battery. TRANSMISSION—Sliding-gear, three speeds and reverse. WHEELBASE—108 inches. WHEELS—34 inches. TIRES—34 x 4 inches. SPRINGS—Half elliptic in front; three-quarter elliptic scroll in rear. PRICE—$1,500.

# "Maxwell"

## MODEL G, ROADSTER, AS CONVERTED INTO TOURING CAR

Unusually stylish and at the same time most convenient for suburban use. A full fledged, roomy touring car with tonneau attached, an elegant roadster with tonneau removed.

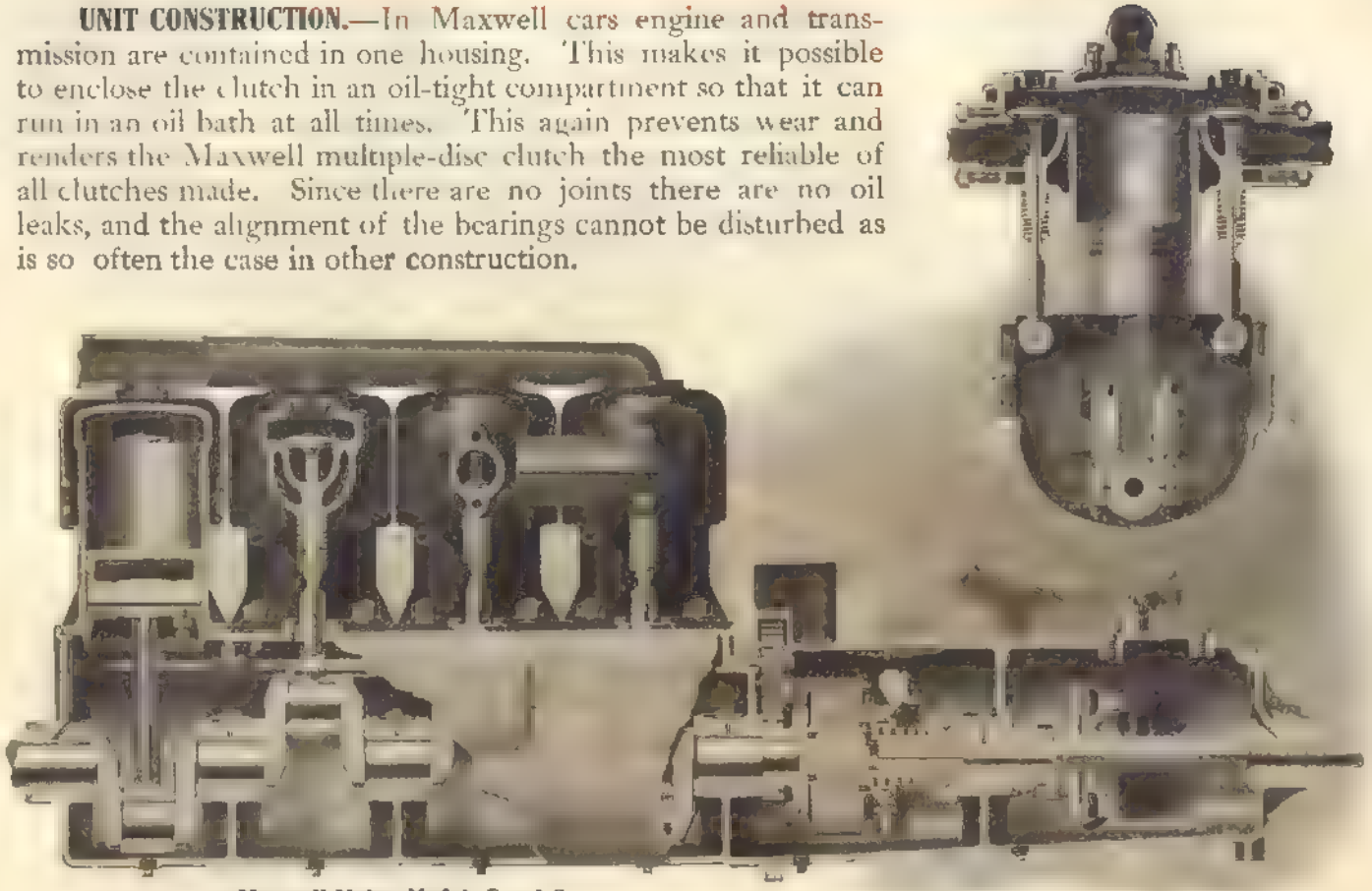


### FOUR-CYLINDER, THIRTY HORSEPOWER

MOTOR—4¼ x 4 inches. IGNITION—Double, Magneto and Battery. TRANSMISSION Sliding gear, three speeds and reverse. WHEELBASE 108 inches. WHEELS 34 inches. TIRES—34 x 4 inches. SPRINGS—Half elliptic in front; three quarter elliptic scroll in rear. PRICE—$1,500. Tonneau and top extra.

# OUR STRONG POINTS

**UNIT CONSTRUCTION.**—In Maxwell cars engine and transmission are contained in one housing. This makes it possible to enclose the clutch in an oil-tight compartment so that it can run in an oil bath at all times. This again prevents wear and renders the Maxwell multiple-disc clutch the most reliable of all clutches made. Since there are no joints there are no oil leaks, and the alignment of the bearings cannot be disturbed as is so often the case in other construction.



Maxwell Motor, Models E and G

### THREE-POINT SUSPENSION

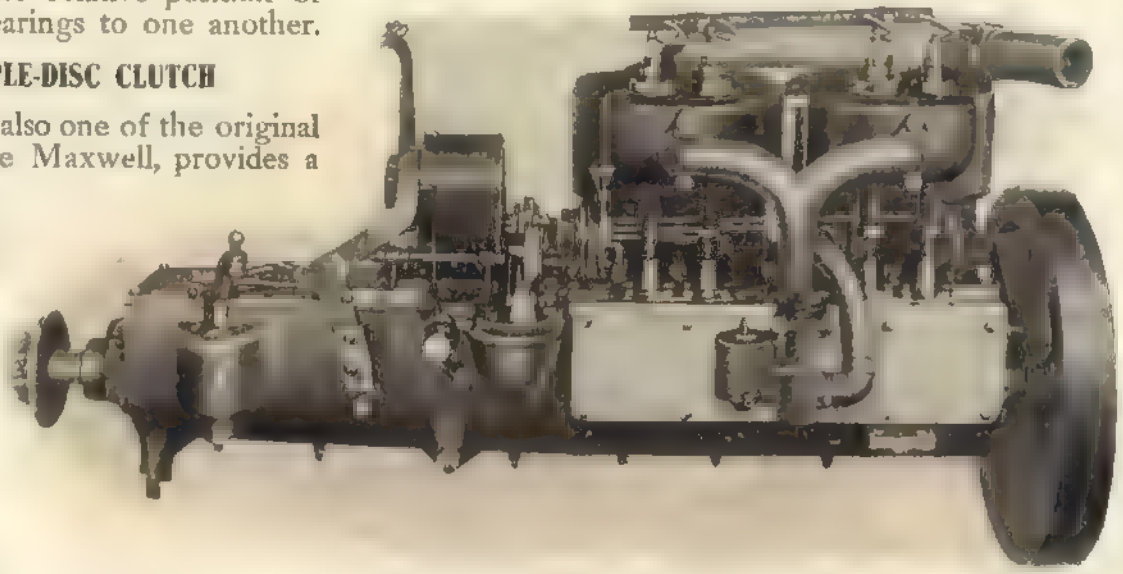
F this principle, too, the Maxwell has been the earliest exponent. The motor is suspended in the chassis at three points. Distortion which otherwise would result in the breaking of shafts and the ruin of engine bearings leaves the Maxwell unaffected, because in consequence of the 3-point suspension distortion of the frame does not change the relative position of the engine bearings to one another.

### MULTIPLE-DISC CLUTCH

This clutch, also one of the original features of the Maxwell, provides a greater contact surface than any other clutch system and is, therefore, more reliable in operation. It requires no attention, and may be enclosed in an oil and dust-proof housing where it is kept lubricated. On account of the multiple-disc clutch, starting and stopping of a Maxwell is accomplished smoothly and without jar.

### THERMO-SYPHON COOLING

was first used in the Maxwell. It cools the motor without the use of a pump, requires no attention whatever and is the only scientifically correct method of cooling the engine. The adoption of the thermo-syphon cooling by a number of manufacturers of 1910 cars is a flattering proof of the excellence of this system.

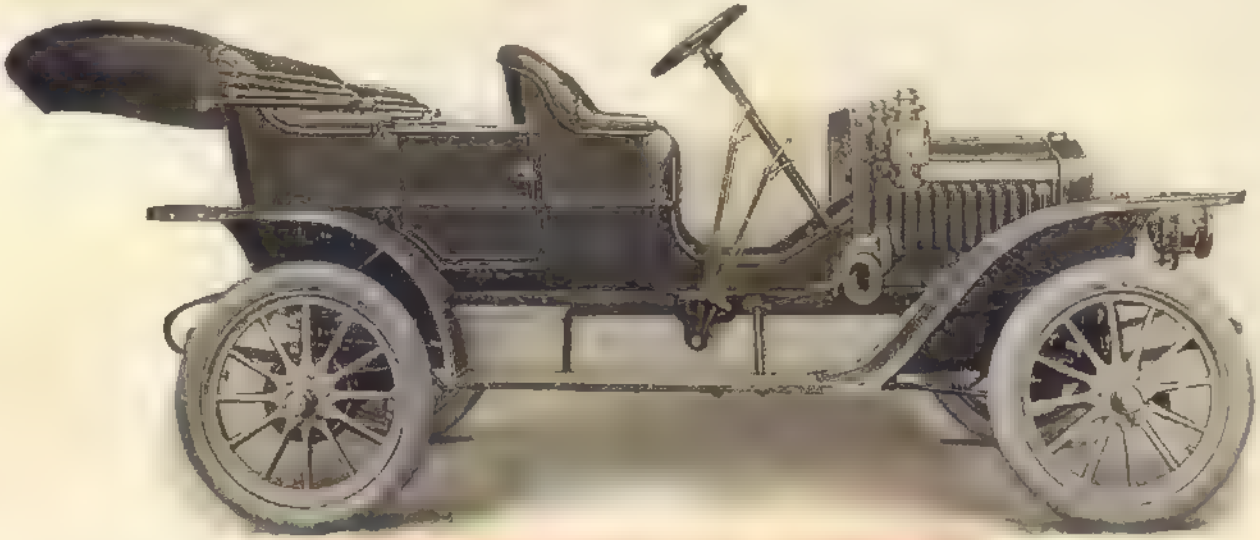


Maxwell Motor, Model Q.

# "Maxwell"

## MODEL Q 3

The classiest small touring car made. Last economical in upkeep. The quickest starter and the smoothest stopper. Climbs hills with marvelous ease.



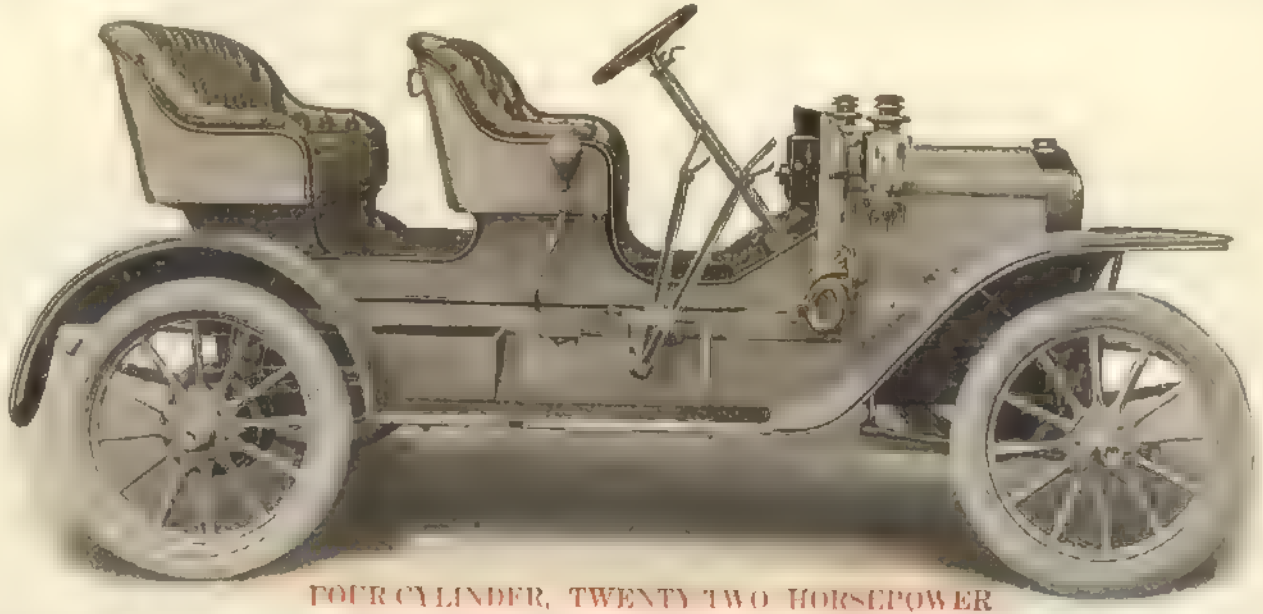
FOUR CYLINDER, TWENTY-TWO HORSEPOWER

MOTOR—3¼ x 4 inches. IGNITION Double, Magneto and Battery. TRANSMISSION—Sliding-gear, three speeds and reverse. WHEELBASE—93 inches. WHEELS 30 inches. TIRES 30 x 3½ inches. SPRINGS Half-elliptic in front; three-quarter elliptic scroll in rear. PRICE $1,000. Top extra.

# "Maxwell"

## MODEL Q 2

With rear seat for two passengers. Rear seat is detached quickly and easily. The box forming the base for rear seat furnishes tool box and carrying space of ample capacity.



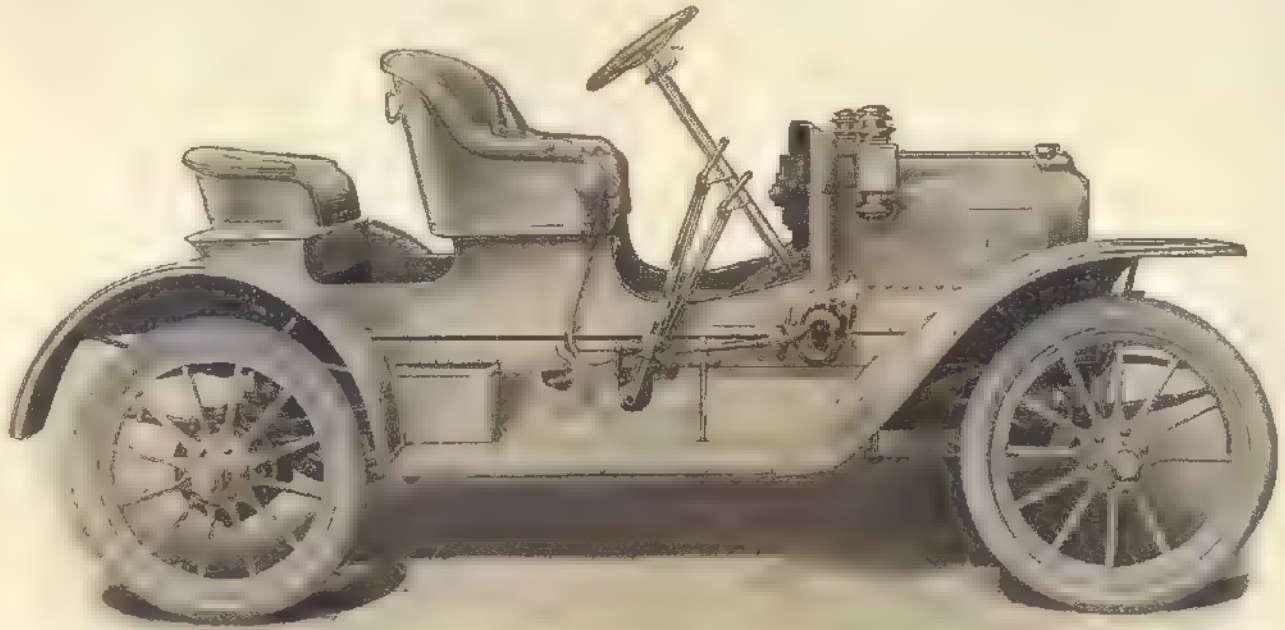
FOUR CYLINDER, TWENTY TWO HORSEPOWER

MOTOR 3½ x 4 inches. IGNITION—Double, Magneto and Battery. TRANSMISSION Sliding gear, three speeds and reverse. WHEELBASE—93 inches. WHEELS—30 inches. TIRES—30 x 3½ inches. SPRINGS Full elliptic, front and rear. PRICE—$950.

# "Maxwell"

## MODEL Q 1

Equipped with detachable rear seat for one passenger. An ever-ready, speedy car, of exceptional value to the professional and business man who takes care of it himself.



### FOUR-CYLINDER, TWENTY-TWO HORSEPOWER

MOTOR 3¾ x 4 inches. IGNITION—Double, Magneto and Battery. TRANSMISSION—Sliding-gear, three speeds and reverse. WHEELBASE—93 inches. WHEELS—30 inches. TIRES—30 x 3½ inches. SPRINGS Full-elliptic, front and rear. PRICE $900.

# THE REASON

EVERY one connected with the manufacture of machinery knows that the greatest expense is in the preparation of designs, patterns, appliances, jigs and tools. Maxwell cars were correct from the beginning and little of our equipment has gone into the scrap heap within the past five years. In consequence, we now manufacture cars without the enormous overhead expense which must be paid by the manufacturer who changes his construction from year to year. In the end these expenses must be added to the selling price of the cars. With Maxwells this is not necessary and the saving is the customer's, as it should be.

Universal Joint

Nothing but the best material enters in the construction of Maxwell cars.

The crankshaft is drop-forged, hardened and finished by grinding, and accurately balanced.

Connecting rods are of I-beam section, drop-forged; and engine and connecting-rod bearings are of compressed babbitt.

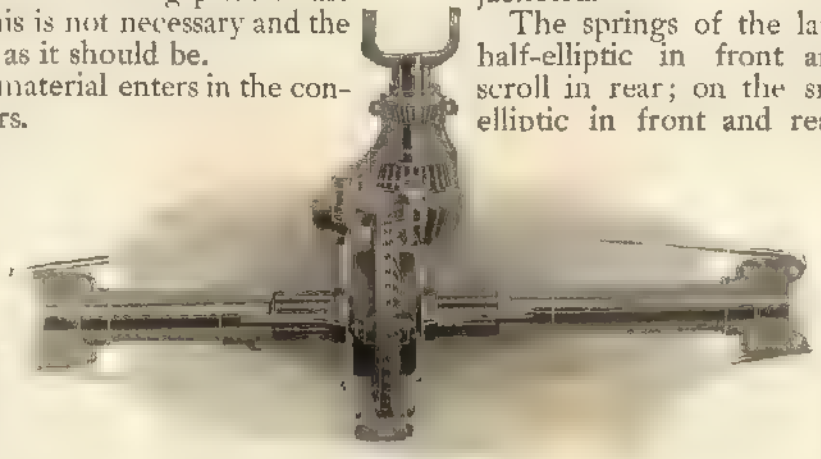
The crankcase is made of a special aluminum alloy and divided into oil compartments insuring perfect lubrication of the bearings at all times.

In our 30-horsepower as well as in our 22-horsepower motor the removal of hand plates affords easy access to the crankshaft bearings for the purpose of inspection or adjustment.

The drive shaft has two universal joints, a construction resulting in an even transmission of the power to the rear axle.

The universal joints are of special design, oil-jacketed.

The springs of the larger Maxwell models are half-elliptic in front and three-quarter elliptic scroll in rear; on the smaller cars they are full-elliptic in front and rear. Bodies are made of steel, with stamped moulding. Careful attention has been given to the construction of brakes. The drums are of large diameter lined with a special asbestos preparation which will not burn out and will last longer than any material heretofore used for the purpose.

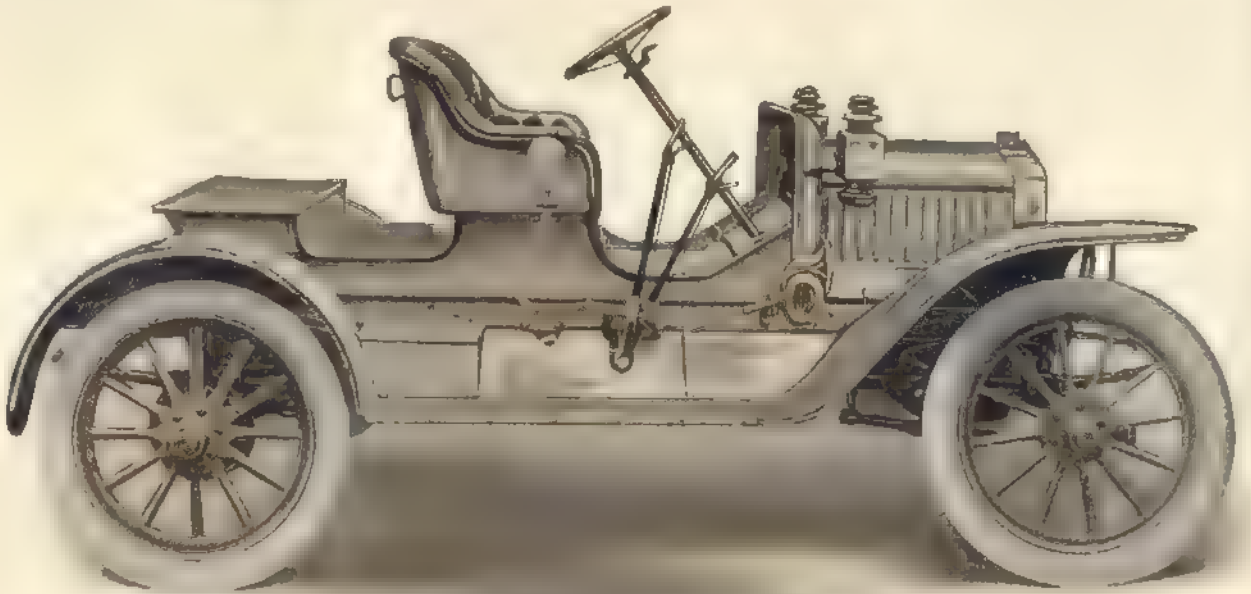


Rear Axle and Differential

# "Maxwell"

## MODEL Q STANDARD

A car for a variety of purposes. The addition of an extra rear seat for one or for two converts this model into a small touring car for the use of the family.



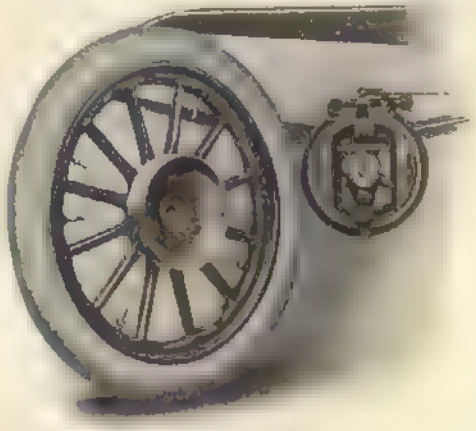
FOUR-CYLINDER, TWENTY-TWO HORSEPOWER

MOTOR—3¼ x 4 inches. IGNITION Double Magneto and Battery. TRANSMISSION Sliding gear three speeds and reverse. WHEELBASE 93 inches. WHEELS—30 inches. TIRES 30 x 3½ inches. SPRINGS Full elliptic, front and rear. PRICE—$850.

# HOW WE DO IT

TO market a motor car which will give fairly good service in the hands of an expert operator is not a very difficult matter. To produce a first-class automobile that will give uniform and unfailing satisfaction to the average user was left to the designer of Maxwell cars.

Who is better qualified to sit in judgment and render expert opinion than the man to whom a Maxwell revealed the genuine joy of automobiling, unmarred by disappointments and undisturbed by the bug-bear of expensive upkeep? Ask the Maxwell owner.



Maxwell Brake Construction

No other car made is so ready and so able to go wherever and whenever you want it to go, covering the greatest number of miles with the lowest fuel consumption and with such freedom from adjustment and repair. Why? Because its construction is right; its material is the best that can be produced; its workmanship is the most skillful—the Maxwell is the car that maintains a well-earned reputation.

Maxwell Multiple-Disc Clutch

The best proof of an automobile's reliability is the testimony of users. We can refer you to a greater number of satisfied owners than any other automobile manufacturer.

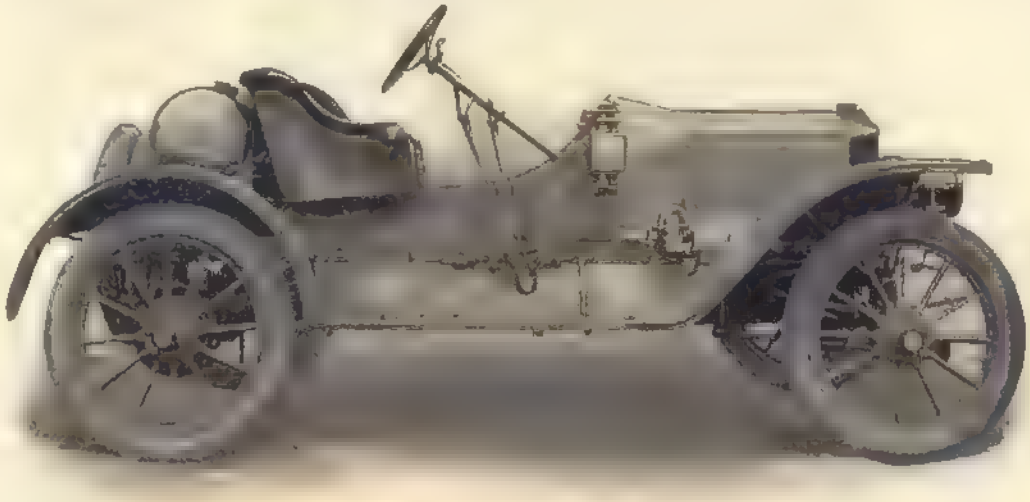
Supported by the judgment of 17,000 owners we can assert, without fear of contradiction, that Maxwell cars represent the greatest automobile value and that Maxwell design has established a high standard by which all medium-priced cars are judged.

Spring Design

# "Maxwell"

## MODEL Q "SPORTSMAN"

Has no equal for hill climbing, and for speed is in a class by itself. Duplicates of the "Sportsman" won in the 1909 climb of Giants' Despair, and furnished the year's surprise at Sunset Hill, Ossining, by defeating the entire field of eleven American cars, three of which were of the six-cylinder type, costing three thousand dollars and over.

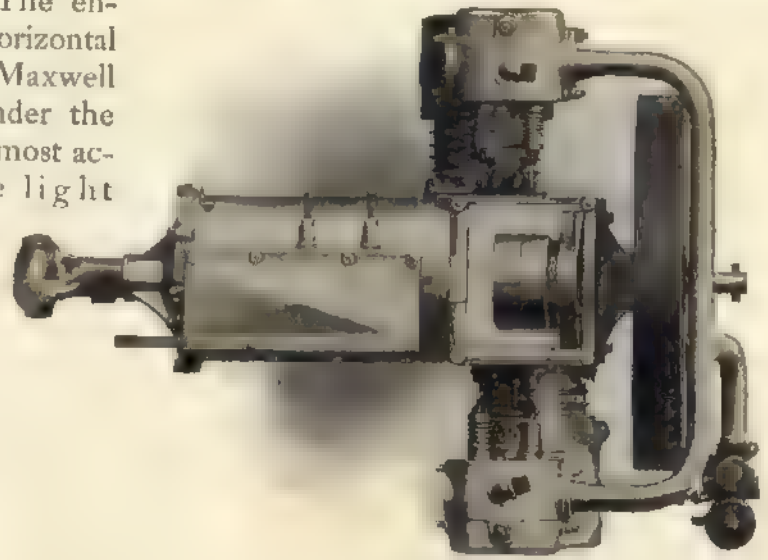


FOUR-CYLINDER, TWENTY-TWO HORSEPOWER

MOTOR—3¼ x 4 inches. IGNITION—Double, Magneto and Battery. TRANSMISSION—Sliding-gear, three speeds and reverse. WHEELBASE—93 inches. WHEELS—30 inches. TIRES—30 x 3½ inches. SPRINGS—Full elliptic, front and rear. PRICE—$1,000. Gas lamps extra.

# THE STANDARD AMERICAN RUNABOUT

THE Maxwell Model A A, the successor of the 1909 Model A, 10 horsepower, 2-cylinder, hardly needs an introduction. Though the first "Model A" runabout was not sold until January, 1909, they are seen in ever-increasing numbers on the highways all over the country. The new representative of this model has a magneto added to its equipment. Otherwise it is the same. The engine is of the horizontal type, located the Maxwell way, in front under the hood, where it is most accessible. The light weight of the car (1100 pounds) makes it economical in tires, thus reducing an important item of automobile upkeep to an almost negligible quantity.



Motor of Maxwell Model AA

In appearance, style and finish, the Model AA is as natty a vehicle as can be produced.

This runabout has invaded most successfully the last stronghold of the horse; for the first time in automobile history a standard runabout is offered at the approximate price of a good horse and carriage. It is not only more economical, but more rapid than the horse; it is not wasteful, for it requires fuel only when in motion—and very little of that.

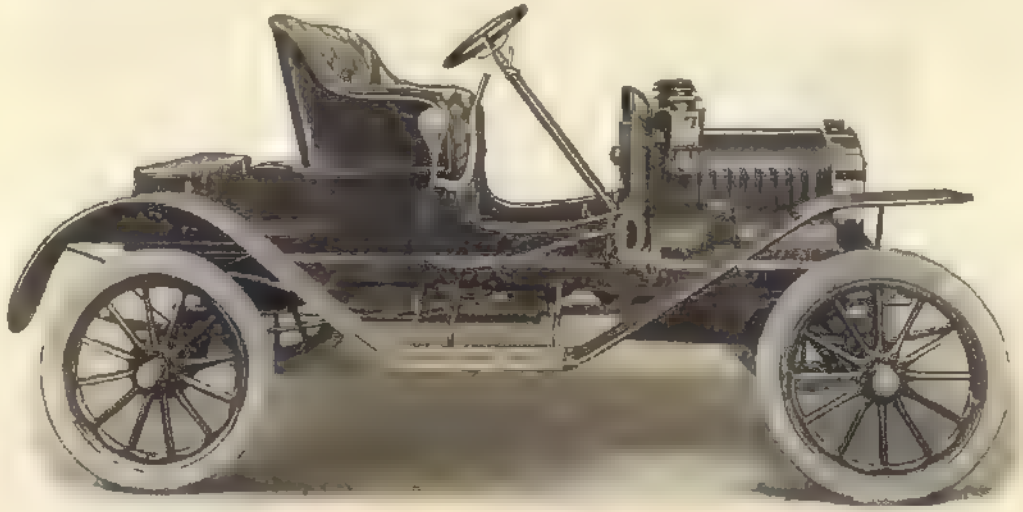
The inclemencies of the weather will not affect it, winter and summer see it with like efficiency; neither shies, nor runs away and is not subject to the troubles common to horses.

Three-point suspension, thermo-syphon cooling, unit construction, multiple-disc clutch, and metal bodies also are found in the Model AA.

# "Maxwell"

## MODEL AA RUNABOUT

The greatest popularizer of automobiling in America. Material and workmanship of recognized Maxwell standard. Without a single rival for economical operation and absolute reliability.



### TWO-CYLINDER, TEN HORSEPOWER

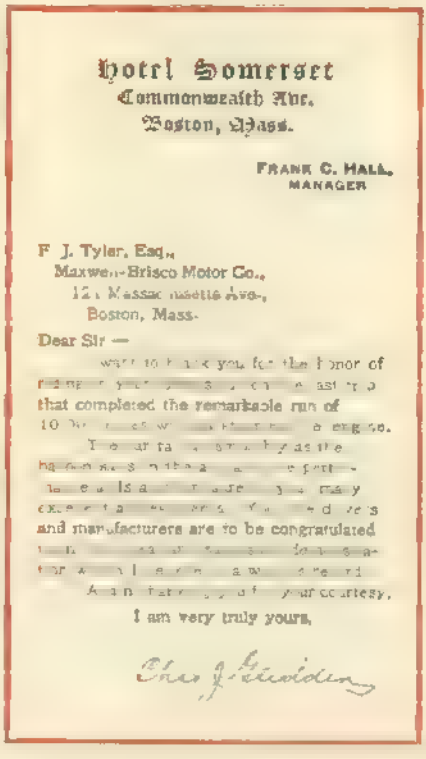
MOTOR—4 x 4 inches. IGNITION—Double, Magneto and Battery. TRANSMISSION—Planetary gear. WHEEL BASE—82 inches. WHEELS—28 inches. TIRES—28 x 3 inches. SPRINGS—Full elliptic, front and rear. PRICE—$550.

# The Greatest Achievement in Automobile History

WHAT every careful buyer should above else seek in his automobile purchase is **Reliability**, of the unfailing kind shown by the Maxwell in its world-famous non-stop run of

**10,000 MILES**

This car—one taken from the stock of our Boston branch—started on March 18, 1909; and was officially stopped on April 12, 1909, when it had completed 10,074 miles of actual road travel without the necessity of stopping the motor once for adjustment or repair.



Hotel Somerset
Commonwealth Ave.
Boston, Mass.

FRANK C. HALL,
MANAGER

F. J. Tyler, Esq.,
Maxwell-Brisco Motor Co.,
121 Massachusetts Ave.,
Boston, Mass.

Dear Sir—

I want to thank you for the honor of [illegible] that completed the remarkable run of [illegible] engine. [illegible] and manufacturers are to be congratulated [illegible]

I am very truly yours,

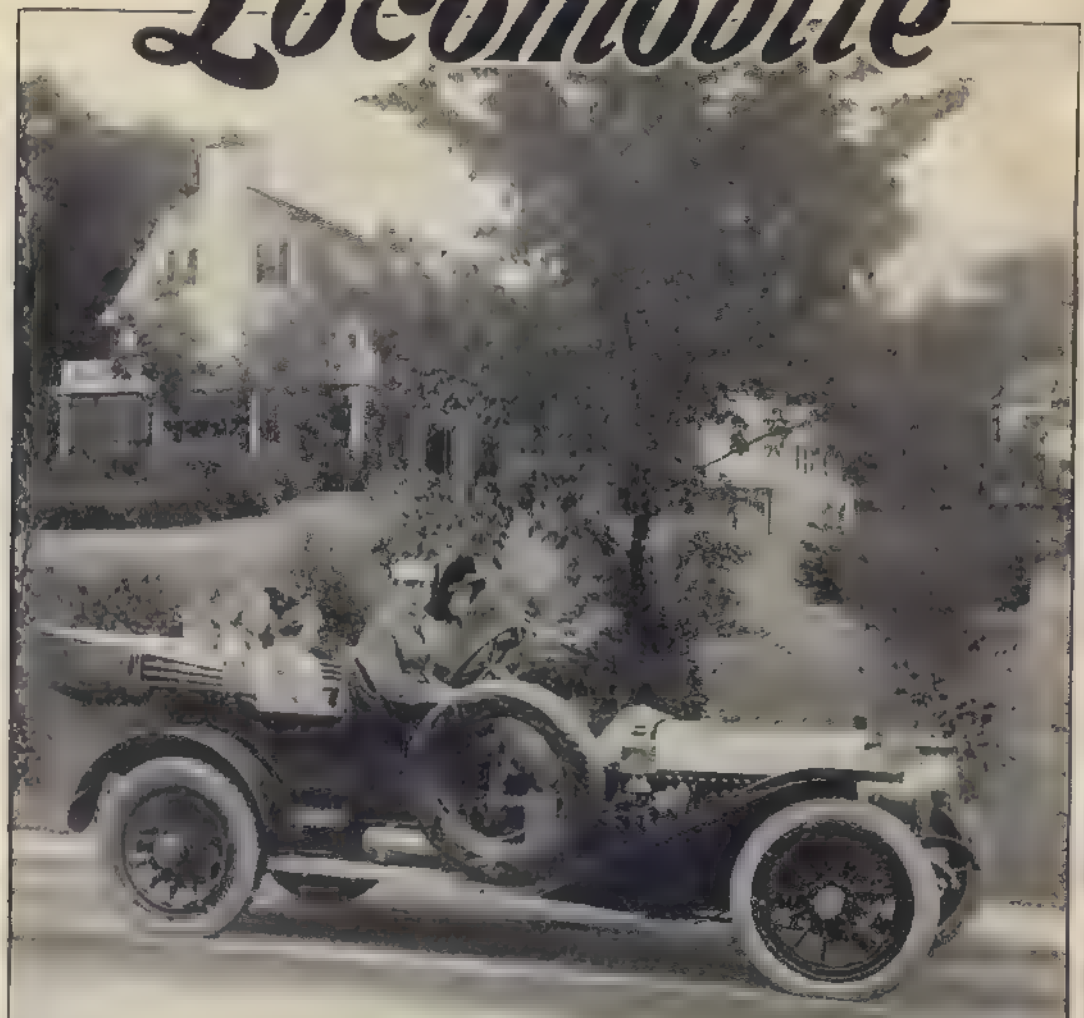
Chas. J. Swinden

A technical committee consisting of Professor Charles F. Park, Professor of Mechanical Engineering at the Massachusetts Technological Institute; Chas. F. Bailey, inventor and owner of the famous Bailey Tread Tire; Virgil A. Charles, of the S. M. Supply Co., of Boston; and James Fortescue, Secretary of the Bay State Automobile Association, dissembled and examined the car at the end of its record-breaking run and found it to be in good general running condition. This report, in full, and the log of the most remarkable run ever undertaken by any automobile will be sent free, upon request made to our main office at Tarrytown, N. Y.

## MAXWELL-BRISCOE MOTOR COMPANY

**Tarrytown, N. Y.** **Pawtucket, R. I.** **Newcastle, Ind.**

# The "30" Locomobile



"30" Shaft Drive 1910 "40" Chain Drive

The Locomobile Co. of America

Bridgeport Conn.

NEW YORK BOSTON CHICAGO

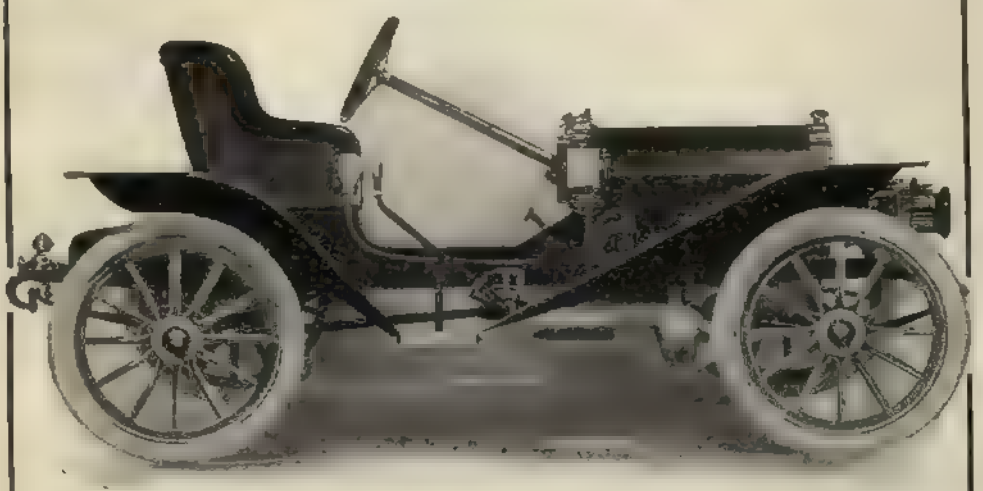
PHILADELPHIA SAN FRANCISCO

MEMBER ASSOCIATION LICENSED AUTOMOBILE MFRS.

# HERE IT IS

# "DEMŌT"

All of the best features of the high-priced cars embodied in a runabout at a price within reach of all.



## $550 Magneto Included

***Write for Agency Proposition***

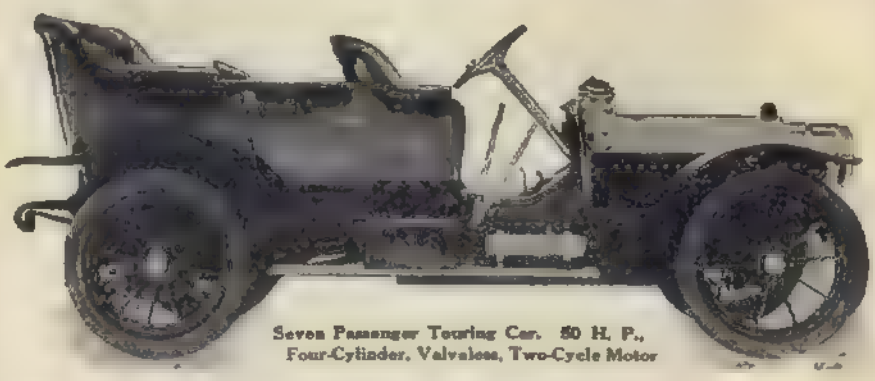
DEMOTCAR SALES CO.
Distributers
45 State Street
DETROIT :: :: MICHIGAN

**Demotcar Company**
Manufacturers

*Not An Assembled Car*

# The American Simplex

**Fifty Horse-power Valveless, Two-Cycle Motor runs with the smooth rhythm and applies power with the constancy of the Electric Motor**



Seven Passenger Touring Car. 50 H. P., Four-Cylinder, Valveless, Two-Cycle Motor

THE day is inevitable when the two-cycle gas engine will be the only type used in motor cars.

¶ We have recognized the virtues of the two-cycle principle—pioneers among manufacturers of high-grade, high-powered cars.

¶ Every manufacturer who puts into his car a six-cylinder engine admits the vital deficiency of the four-cycle principle—intermittent power—and his inability to overcome it.

¶ Multiplicity of cylinders merely approaches—never attains—constant turning power—the continuous torque you hear so much about.

¶ The American Simplex valveless two-cycle engine applies power with the constancy of the electric motor.

¶ There is not a valve, spring, roller, cam or camshaft on the American Simplex two-cycle engine. They would be superfluous. They hinder the four-cycle from generating its power in a steady, unceasing rush—yet the four-cycle engine cannot be built without them.

¶ The American Simplex is manufactured in our own plant in its entirety—motor, transmission, differential, gears, frame—every part where strength or harmonious action is vital to the long life of the car and the smoothness with which its motor runs.

¶ That is the reason the American Simplex is a motor car symphony—it has that complete harmonization of parts which no assembled car can have.

¶ Our 1910 literature tells of the flexible, three-point motor suspension; flexible radiator attachment; the rear axle transmission; the interlocking device on the gears; the improved torsion tube; the everlasting brake adjustment—every one a feature exclusive in the American Simplex—together with a comprehensive explanation of the differences between the American Simplex valveless, two-cycle motor and all four-cycle motors

¶ Write for it.

**SIMPLEX MOTOR CAR COMPANY, Mishawaka, Ind.**

Member A. M. C. M. A.

# 1910

# Full CORBIN Jeweled

*Deliveries Commence August First*

A continuation of the 1909 car which has proved so universally satisfactory that we have not been able to supply the demand. A splendid car perfected.

WE ARE VERY ENTHUSIASTIC ABOUT THE QUALITY OF OUR PRODUCT WHY NOT? WHEN WE MANUFACTURE EVERY VITAL PART THAT ENTERS INTO THE CONSTRUCTION OF OUR CARS, AND KNOW, THEREFORE, THAT NONE BUT THE BEST MATERIALS AND WORKMANSHIP ARE USED.

Find us a Corbin owner who is not equally enthusiastic.

**Touring Cars, Runabouts and Toy Tonneaus, $2750.00**

Including Cape Top, Bosch-Magneto and Prest-O-Lite Tank in addition to all regular equipment.

WRITE FOR ADVANCE CIRCULAR

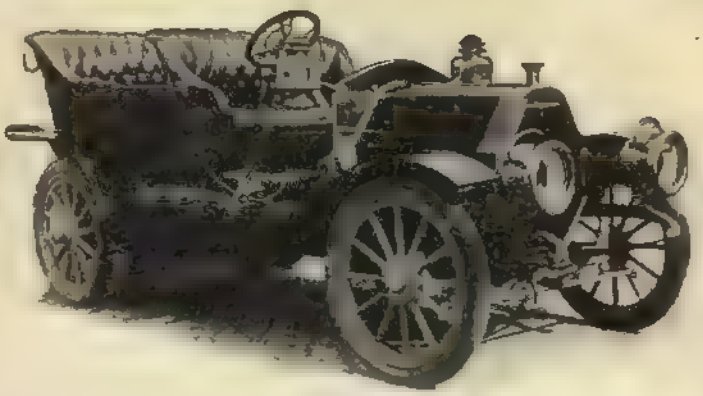
## The Corbin Motor Vehicle Corporation

(Member A. L. A. M.)

NEW BRITAIN :: :: :: :: :: CONNECTICUT

# CAR AHEAD!

Weight 1700 lbs.



30 H.P. (Actual)

# RIDER-LEWIS "FOUR"

## The Biggest Little Car Ever Built

¶ In design, appearance and ability, the Rider-Lewis IV easily heads the list of popular priced cars.

### FEATURES:

| | |
|---|---|
| Four Cylinders | Flexible Motor Supports |
| Valves in the Head | Rear Axle Gear Set, 3 Speeds |
| Magneto Ignition | Straight Line Drive |
| Thermo-Syphon Cooling | Light Weight |
| 32" x 3½" Tires | 100" Wheel Base |

**Simplicity the Very Keynote of the Design**

**WE ALSO MANUFACTURE THE EXCELLENT SIX**

**(The Most Luxurious of Cars), Price, $2500**

CATALOG ON REQUEST. AGENTS GET OUR PROPOSITION

**Price, $1000**

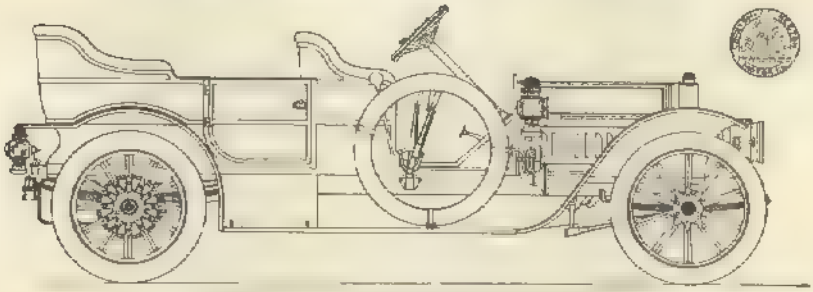
**The Rider-Lewis Motor Car Co.**
Anderson, Indiana

Eastern Distributor:—H. J. Koehler Sporting Goods Co., 1709 Broadway, New York City

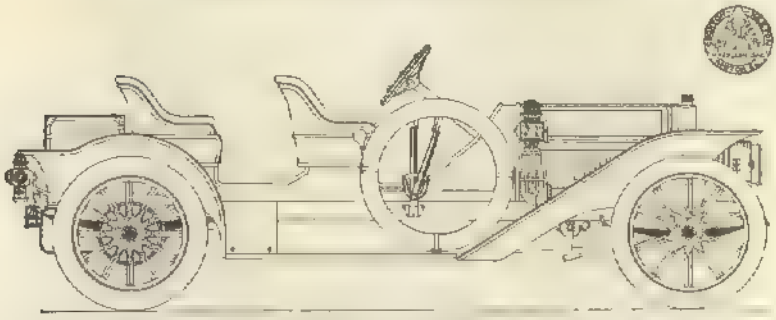
# Croxton-Keeton Cars

## For 1910

## "German 45" Types



GERMAN 45 TOURING CAR, $3500



GERMAN 45 ROADSTER, $3500

Each model has 45 H. P., 4 cylinder vertical engine. Dual ignition system, with Bosch High Tension Magneto. Selective sliding gear transmission. Three speeds forward and reverse. Wheel base, 130". 36" wheels. Tires, 4" front and 4½" rear—any standard make. Furnished with 7-passenger touring body, $3500; 5-passenger, close coupled, $3500; 3 or 4 passenger roadster, $3500; 7-passenger limousine, $4000.

Our line also includes the French 30 models—4-passenger suburban, $2850; 6-passenger touring car, $3250; landaulet, $3300; brougham, $3500.

**DEALERS**—don't close for your 1910 cars without first thoroughly investigating the **CROXTON-KEETON** line, and getting our proposition.

## The Croxton-Keeton Motor Co.

### Massillon, Ohio

NEW YORK
1662 Broadway

PITTSBURGH
5920 Baum St.

CLEVELAND
2174 E. 9th St.

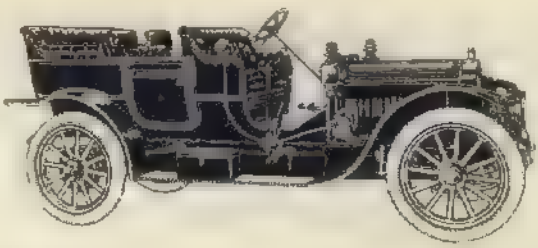
PROVIDENCE
430 Broad St.

TOLEDO
233-7 Ontario St.

KANSAS CITY
425 Delaware St.

CHICAGO, Michigan Ave. and 21st St.

The 1910 Elmore
Four Cylinder
Five Passenger
$1750



The 1910 Elmore
Four Cylinder
Seven Passenger
$2500

# Two new Elmore types for 1910 in which the power-development is increased approximately 33⅓ per cent

For three successive years—1906 for 1907, 1907 for 1908, and 1908 for 1909—we have printed an announcement, which recorded

(a) That our output for the current season was exhausted—early in the summer.

(b) That the output for the coming season would be increased

Precisely the same condition obtains at the present moment. Not one of the 1909 models remains in the factory. They have all been sold—95 per cent. of them are in the owners' hands.

And on the heels of this splendid demand comes the most important announcement ever issued from the Elmore plant—the most important, in all probability, that will be made this year by any American manufacturer.

## 33⅓ per cent more power for 1910

In order that you may grasp its full significance, let us explain at once that it contemplates two new Elmore models, in each of which the power is increased approximately 33 1-3 per cent without any change of price.

In the one case you have a five passenger, four cylinder Elmore valveless two cycle car, which will sell for $1750.

This four cylinder car (bearing in mind the almost two-for-one power-development of the valveless two cycle engine over the four cycle) will be without a running mate in the world at the price

There will literally be no car like it in America at an approximate figure—no car comparable with it in point of power and size, and efficiency and luxuriousness.

The most ambitious offerings in the four cycle field, which you may have accepted heretofore as examples of noteworthy value-giving, become commonplace in contrast to this superb car, first:

Because the best of these four cycle cars are small and stinted in size, and especially because they retain all the disadvantages of the four cycle type.

Second, because all the proven excellences of Elmore construction; all the virtues and advantages of the valveless two cycle engine; are emphasized in this five passenger, four cylinder car. By reason of that engine and its continuous impulse, this $1750 Elmore will render more power-service, and render it more cheaply and with less complication than the average four cycle car selling for $2500

Three years ago we ventured the prediction that the four cycle engine had reached the limit of its development.

That engine, we said, was subversive of progress because it tended toward complication instead of away from it

We argued that there were only two ways out of the four cycle dilemma. One was to seek increased power through an increased number of cylinders. This meant going deeper into the mire of complication, because every cylinder added meant more valves and attendant parts. The other was to reconcile the buyer to the shortcomings of his engine by lower prices

Both of these conditions have come to pass

When we said further that the world must look to the Elmore valveless two cycle engine for truly scientific development, because it alone attained absolute simplicity—we merely forecast the arrival of these two wonderful Elmore cars for 1910

Because it is this very simplicity of the engine and the entire chassis that has made possible the five passenger, four cylinder Elmore for 1910 with its magnificent power plant at $1750 00; and the larger, finer, seven passenger, four cylinder Elmore at $2500 00 with its power augmented a full 33 1-3 per cent

The Elmore line for 1910 will consist of:

Model 36 (36 H. P.)—Five passenger, four cylinder touring car; four passenger, detachable demi-tonneau; doctor's coupe; and landaulet.

Model 46 (46 H. P.)—Seven passenger, four cylinder touring car; seven passenger, four cylinder limousine

To the public and to Elmore dealers for the fourth successive year, a word of warning.

Once again our increased output will not satisfy the inevitable demand for 1910.

Of all the remarkable cars which have proceeded from the Elmore plant since its inception, these are by all odds the most noteworthy.

It will be wisdom on your part, therefore, to arrange with your Elmore dealer for an early inspection.

## The Elmore Manufacturing Company

### 904 Amanda Street, Clyde, Ohio

# THE 1910 GREYHOUND

will be the kind of Motorcycle you would like to ride.

Plenty of power, fine lines, excellent materials and methods throughout, and

## Comfort Devices

excelling any motorcycle you have ever seen.

The Greyhound Shock Absorber (patented) which we introduced a year ago has fully proved itself the best comfort feature ever applied to a motorcycle.

Supplementing this in the new model will be a new spring fork, equally good in its place, so you will simply float on springs when you ride the new Greyhound. Detail information on this bright, new machine will be yours for the asking, so send in your name and find out about it.

A few good second-hand machines at low prices.

## Greyhound Motor Works

**1453 Niagara St., BUFFALO, N. Y.**

SALES AGENTS

**Metropolitan District:**

**THE BROWN-DEWEY CO.**

**1697 Broadway (53d Street), New York**

**Chicago District:**

**WHIPPLE, "The Motorcycle Man"**

**260 W. Jackson Blvd., Chicago, Ill.**

## "Wouldn't Take a *Thousand Dollars* For His Curtiss Motorcycle"

Altoona Pa. May 28, 1909

Herring Curtiss Company
Hammondsport N. Y.

Gentlemen:

My Nine arrived in fine condition. I have had three different makes in my time and must say that your machine for Power, Speed, Hill Climbing and Easy Starting can never be beaten. I am more than pleased with this little steed of steel, and would not take *One Thousand Dollars* for it to-day if I couldn't get another one.

Thanking you for your prompt and courteous attention given my order I am,

Yours very truly
A. M CONRAD.

This is but one of hundreds of similar unsolicited testimonials received from Curtiss riders.

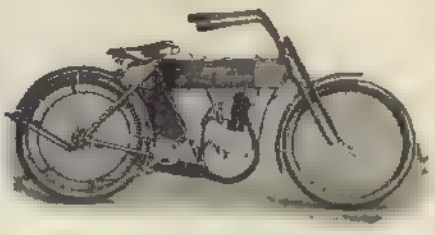
Every Curtiss motorcycle is just as good as this one.

Write for Agency Proposal to-day.

**HERRING-CURTISS COMPANY**
**Hammondsport :: New York**

New York Distributor
**CURTISS MOTORCYCLE COMPANY**
**1203 Bedford Ave., Brooklyn, N. Y.**

Pacific Coast Distributor
**G. A. FAULKNER**
**351 12th Street Oakland, Cal.**



IN the 1909 F. A. M. Endurance Run, 3 **HARLEY-DAVIDSON** machines entered in the trade riders' class, received PERFECT SCORES, and in the private owners' class there were BUT TWO PERFECT SCORES, AND THE **HARLEY-DAVIDSON** WAS ONE OF THEM

Do not forget that the **HARLEY-DAVIDSON** is the machine which won the highest possible honors in the 1908 F. A. M. contest by winning the only diamond medal awarded.

**The HARLEY DAVIDSON Can't be Beat**

## HARLEY-DAVIDSON MOTOR COMPANY

**MILWAUKEE, WIS.**

## The 1910 Elmore

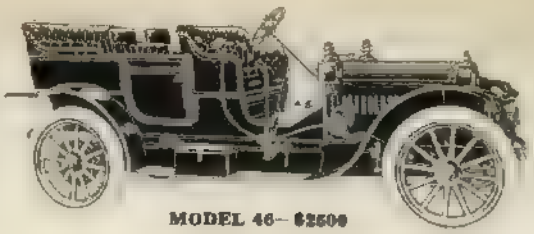
Model 36

Supplied as Five Passenger Four cylinder Touring Car.

Four passenger, four cylinder detachable Demi-Tonneau.

Four cylinder Doctor's Coupe.

Four cylinder Landaulet.



MODEL 46—$2500

## The 1910 Elmore

Model 46

Supplied as

Seven passenger, four cylinder Touring Car.

Seven passenger, four cylinder Limousine.

# The Elmore is the one car of which you can safely say: "Tomorrow---or a year from tomorrow---it will run as finely as it did today."

Do you realize that there are four or five thousand people (Elmore owners) in this country who know nothing whatever about the troubles you encounter in your four-cycle car—who never have known them?

You would like to find, if you could, a car which is practically repair-proof; which you would not be compelled to build over, by replacing some vital part, every 30, 60 or 90 days; whose life would not be a single season, but an indefinite number of seasons; whose cost of maintenance would be practically nil.

But you realize the futility of seeking such a car in the four-cycle field; because you know that the principle of the four-cycle engine itself makes such certainty a mechanical impossibility. As long as you have valves and cams and springs and lifts and rollers with all their consequential troubles—just so long must you say to yourself:

"Well, the car made today's trip beautifully—but how about tomorrow?"

Mark this statement **and verify** it:—The 1910 Elmore has the simplest, the safest, the surest and the most economical motor in the world today; and an ignition system so perfect that you are actually not conscious of its presence in the car.

We mean this comparison to include any four-cycle engine—in the car you own, or plan to own, whether its price be the highest or the lowest.

If you are ready to make the most casual sort of investigation, you will find the 1910 Elmore cars to be exactly the kind of cars we have described—and you will find it necessary to revise all your ideas of automobile value.

The Model 36 four cylinder Elmore is good at any time and all times for 50 miles an hour on the straightaway; develops a full 36-H. P.; will take a grade of 6 to 8% at 35 to 40 miles an hour—and sells for $1750.00.

No car of its type and size at anything like the price will compare with it in performance and offer the same perfect immunity from trouble and expense.

Model 46 is the most perfect two cycle motor the world has ever seen—because it incorporates an infallible system of gas distribution which supplies the one element which engineers have always agreed would make the Elmore engine the peer of any other in existence.

No matter what price you pay for your four-cycle car, you will have to encounter every one of the four-cycle disadvantages which Elmore owners escape entirely.

The experience of the four or five thousand people who own Elmore cars is an experience that you cannot afford to ignore.

Send the coupon and get in touch with your Elmore dealer.

THE ELMORE MFG. CO.
904 Amanda St.
Clyde, Ohio

Send me the advance literature describing the 36-H. P. 5-passenger, valve-less, four-cycle Elmore car at $1750 and the 46-H. P. 7 passenger Elmore at $2500

Name

Address

Town..... State.....

# The Elmore Manufacturing Company

## 904 Amanda Street, Clyde, Ohio

Member Association of Licensed Automobile Manufacturers

# WAY FOR THE 1910 GREYHOUND!

WE are now bending all our energies to the production of a Motorcycle for 1910 that will absolutely lead the procession.

We have a small stock of motorcycles of 1909 and earlier models on which we are willing to make prices that will sell them. The second-hand ones have been put in good shape in our Repair Department and we can show you a chance to get exceptional motorcycle value for a reasonable amount of money.

Ask us about it and we will do our best to take right care of you.

**Greyhound Motor Works**
**1453 Niagara Street, Buffalo, N. Y.**

SALES AGENTS:
METROPOLITAN DISTRICT:
The Brown-Dewey Company, 1697 Broadway, (53rd St.) New York.
CHICAGO DISTRICT:
Whipple, "The Motorcycle Man," 260 W. Jackson Blvd., Chicago, Ill.

## "Wouldn't Take a *Thousand Dollars* For His Curtiss Motorcycle"

Altoona Pa., May 28, 1909.
Herring Curtiss Company,
Hammondsport, N. Y.
Gentlemen:
Machine arrived in fine condition. I have had three different makes in this time and must say that your machine for Power, Speed, Hill Climbing and Easy Starting can't be beaten. I am more than pleased with this little steed of steel, and would not take *One Thousand Dollars* for it to-day, if I couldn't get another one.
Thanking you for your prompt and courteous attention given my order, I am
Yours very truly,
A. M. CONRAD

This is but one of hundreds of similar unsolicited testimonials received from Curtiss riders.

Every Curtiss motorcycle is just as good as this one.

Write for Agency Proposal to-day.

**HERRING-CURTISS COMPANY**
**Hammondsport :: New York**
New York Distributor
**CURTISS MOTORCYCLE COMPANY**
**1203 Bedford Ave., Brooklyn, N. Y.**
Pacific Coast Distributor
**G. A. FAULKNER**
**351 12th Street Oakland, Cal.**

# MIDGET BI-CAR

The most comfortable Motorcycle produced. Built like a car. Agents better hear our proposition before closing contracts.

**Walton Motor Co. (Inc.)**
**Lynbrook, Long Island**
Sole Licensees and Manufacturers

# BARGAINS

If you have not sent your name in for our big accessory catalog you have missed a good thing and lost $ $.

About half the riders in America buy parts from us because all are guaranteed and the prices are the lowest. We have the largest accessory stock in America. Send postal to-day for catalog A.

MOTORCYCLE EQUIPMENT CO.
Hammondsport, N. Y.

Winner of the Only Diamond Medal, 1908

## F. A. M. Endurance Run

## The 1909 Harley-Davidson

better than ever

SEND FOR CATALOGUE

HARLEY-DAVIDSON MOTOR COMPANY
MILWAUKEE

## MERKEL-LIGHT

BELT AND CHAIN-DRIVEN

## MOTORCYCLES

have more exclusive meritorious features than any other motorcycle on the market a strong statement, but substantiated by facts. Get our catalog for details about the **Merkel Ball Bearing Motor; Spring Frame and Fork;** automatic mechanical force feed lubricator; laverless and jointless hand e-bar control etc.

It's free for the asking.

MERKEL-LIGHT MOTOR COMPANY, Pottstown, Pa.

## Motorcycle Accessories

Send for largest and most complete catalogue ever issued. **Indian & Harley-Davidson Motorcycles, $50 Up.**

F. B. Widmayer Company, 2312 Broadway New York City

## Torpedo Motorcycles

WHY HESITATE? Unless you ride the BEST you cannot be a SATISFIED MOTORCYCLIST You know there can be but one BEST and that is the TORPEDO. Write for catalog and agent's terms

The Hornecker Motor Mfg. Company
Geneseo, Ill., U. S. A.

## SPROCKETS

for Bicycle and Motorcycle

WE MAKE 90 PER CENT OF THE SPROCKETS USED

THE PARISH & BINGHAM CO.
Cleveland, Ohio

THE "KENO CONNECTION"

is the best pump nipple ever made. One sample for 15c.

Stevens & Co.

99 Chambers St., New York City, N. Y.

CHILTON STOCK DESIGNS OF

# POST CARDS

are money-makers for automobile dealers

**Send for Specimen Sheet No. 101**

Chilton Printing Co., Market & 49th Streets, Phila.

# 1910 HART-KRAFT 1910

## COMMERCIAL POWER WAGONS

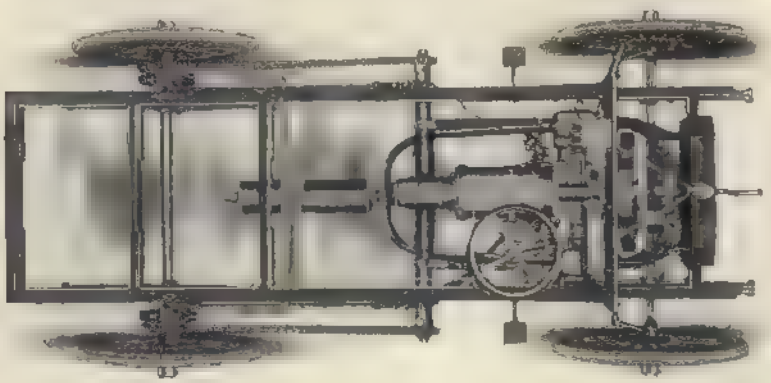
Unit Power Plant
Magneto Ignition
Timken Bearings
Planetary Gearing
Multiple Disc Clutch
Double Opposed Motor
Water Cooled
Full Elliptic Springs
Double Chain Drive
Solid Tires

All parts of the Power Plant are easily accessible from the Driver's Seat

Special Bodies of Selected Design made to suit Customers

Capacity: 1000 pounds

**THE HART-KRAFT MODEL B** is the highest grade Motor Wagon chassis ever produced. It is for the man who wants a High Class Motor Wagon one that will deliver his goods DAILY at a much reduced cost—the specialty of a factory that produces only Power Wagons of 1000 pounds capacity.



## HART-KRAFT MOTOR COMPANY

YORK, PENNA.

# THE COMMERCIAL MOTORCAR CO.

INCORPORATED 1905

TIMES BUILDING

NEW YORK, N. Y.

COMMERCIAL MOTOR VEHICLES OF EVERY SIZE AND TYPE, BOTH GASOLENE AND ELECTRIC.

AUTOMOBILE DELIVERY AND TRANSPORTATION SYSTEMS INSTALLED COMPLETE.

OUR NEW CATALOGUE IS READY FOR DISTRIBUTION

# A Chance for the DEALER

*Five Ton Truck just shipped to the R. A. McKinnon Co., Little Falls, N. Y. Takes the place of three teams and two men. Cost for up-keep same as one team. Sixty horse power, four cylinder motor*

YOU know how much—or little—you make out of your repair department as a dealer in pleasure cars. You know how many whims and fancies you have to meet in selling them.

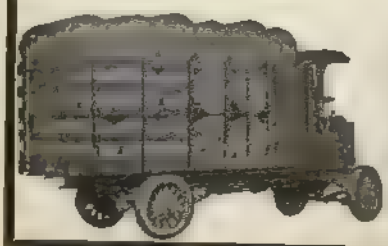
I want to introduce you to a business that has all the possibilities, as to volume, of the pleasure car trade, with less selling expense and practically no repair bother.

# "American-Trucks" (4 Cyl.)

can be sold in any city. The demand is increasing every day. The dealer who gets the agency **now** is slated for a good, profitable, growing business.

**American Motor Truck Co.** E. B. Olmstead, Vice-Pres. **Lockport, N. Y.**

*Rapid*



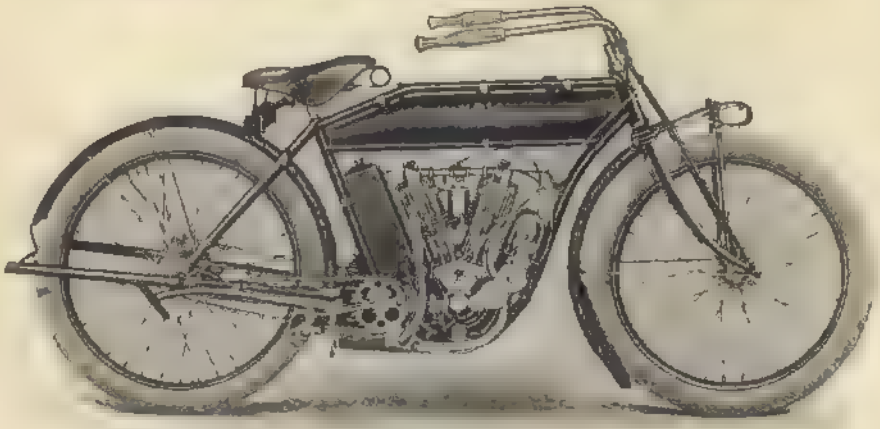
# *Commercial Power Wagons*

offer greater money-making possibilities to the live agent or business man, with financial backing, than any other line. Rapid Commercial Power Wagons are built in sizes from ½ to 6 tons capacity, for any line of business. Every user of one or more horses represents a prospective buyer. See the possibilities now? Write today for catalog and agent's prospectus.

**RAPID MOTOR VEHICLE COMPANY**

**211 Rapid St., Pontiac, Mich., U. S. A.**

# 1910 INDIANS



**HAVE ALL** the latest advanced features in Motocycle design. Cradle Spring Forks; Automatic Mechanical Oiler. Other Refinements of Perfection.

*Advance Catalog F Ready*

**HENDEE MANUFACTURING COMPANY, Springfield, Mass.** (Member M. M. A.)
Chicago Branch, 1251 Michigan Ave., London Branch, 184 Gt. Portland St.

## Long Life and Large Mileage
*Also SAFETY*
The Keynote of the Introduction of

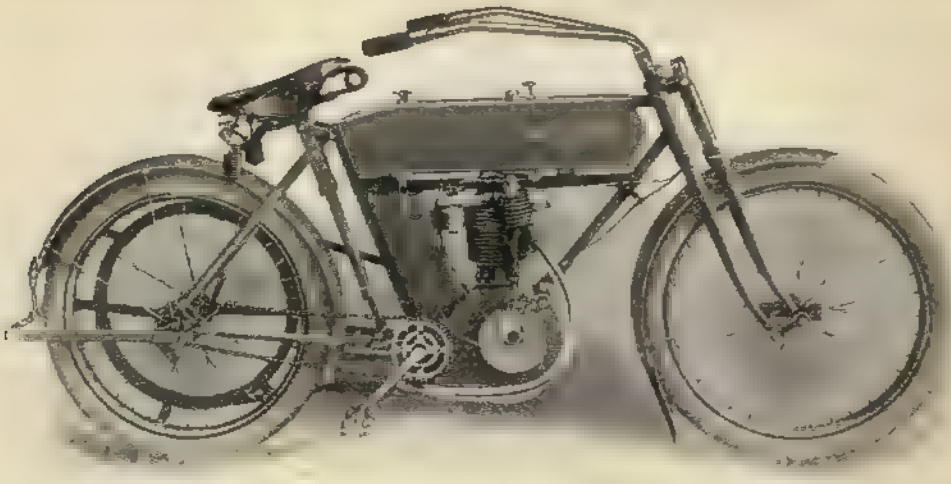
# Diamond

**Motor Cycle Tires**
**Casings and Tubes**

**Of Equal Merit** with Diamond Automobile Tires and worthy of the name

*The Diamond Rubber Company, Akron, O.*
NEW SPECIAL CATALOG ON REQUEST

# 1910 GREYHOUND



4½ H. P., large fly-wheel in oil-tight aluminum case, double grip control, V or flat belt, combination tank for gasoline, oil, batteries and coil. **The Greyhound Shock Absorber** and cushion frame the greatest of all the comfort devices. Large tool box, wheels 28 x 2½. Fine lines, best material and workmanship.

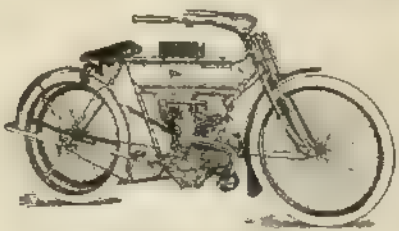
Send for full details. Proper inducements to proper agents

**GREYHOUND MOTOR WORKS :: 1453 Niagara St. :: Buffalo, New York**

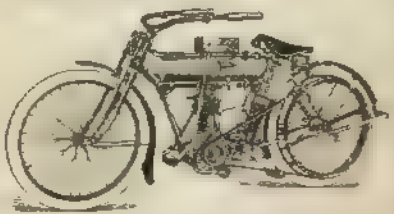
Member Motorcycle Manufacturers Association

SALES AGENTS—Metropolitan District—The Brown Dewey Co., 1697 Broadway, New York, N. Y. Chicago District—Whipple, "The Motorcycle Man," 260 W. Jackson Blvd., Chicago, Ill.

# 1910 YALE MOTORCYCLES
## ARE BEING DELIVERED



**6½ H. P. TWIN**
S. G. V. belt. Bosch magneto,
**$300.**



**3½ H. P. SINGLE**
**Flat belt and idler, battery ignition, $200 S. G. V. belt optional. Herz magneto, $35 extra.**

¶ The Yale Motorcycle holds the **World's Record** for **Endurance**, and has **made good** in every test, no matter how severe.

¶ The Yale Motorcycle is operated at less **upkeep expense** than any other.

¶ The Yale Motorcycle is ideal for touring and business, because it runs **all the time** and is **free from trouble.**

¶ The Yale Motorcycle agency proposition for 1910 is very **attractive.**

IMMEDIATE DELIVERIES. WRITE FOR INFORMATION.

"RIDE A YALE, THEY NEVER FAIL"

**The Consolidated Mfg. Co., 1710 Fernwood Ave., Toledo, Ohio**

We also make Yale and Snell Bicycles, Consolidated Package Cars, Hussey Handle Bars and Drop Forgings of every description

# INFORMATION for AGENTS

1910 is to be an agents' year. Now and [illegible] several the country. Some very good sample cars are [illegible] and for the [illegible] Trade [illegible] that will [illegible] for [illegible]

[illegible] but the difficulty is to select the one that [illegible] the best [illegible] the least difficult to sell and the least expensive to keep sold. Your selection [illegible] advertisement.

# 1910 Knox LINE

## "WINNERS OF CONTESTS AND CUSTOMERS"

[illegible] consideration as the most complete and representative, as well as the most versatile [illegible]

## CAN YOU SELL

[illegible] H. P. Touring Cars, Town Limits Tonneauettes, single or double rumble Racebouts, single [illegible] Sport cars, [illegible] Sight Seeing Vehicles, Omnibuses, Ambulances, [illegible] We make them all and [illegible] from [illegible]

## KNOX AUTOMOBILE CO.

MEMBERS A. L. A. M. SPRINGFIELD, MASS.

# Pullman AUTOMOBILES

Model K Touring Car, 30 H. P.

Price $2,000

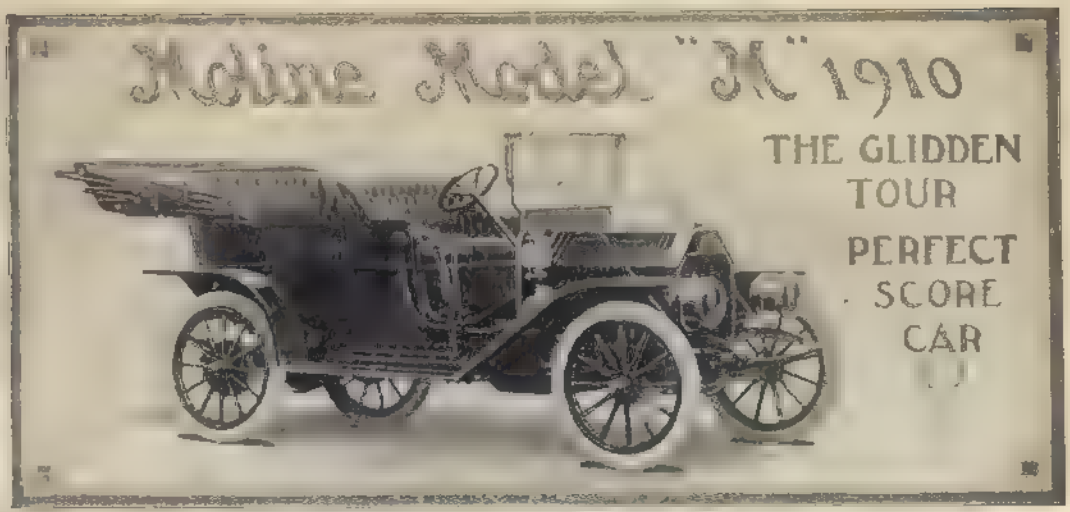
"Not only the best at the price; But the best at any price."

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Model I, | 20 H. P. | Runabout, | $1500 | Model 6-40, | Light Speed Car, | | $2500 |
| " L, | 20 " | Toy Tonneau, | 1600 | " 4-40, | Roadster, | | 3000 |
| " K, | 30 " | " " | 2000 | " M, | Touring Car, | | 3500 |
| " K, | 30 " | Touring Car, | 2000 | " M, | Toy Tonneau, | | 3500 |

Once "PULLMAN" always "PULLMAN"

YORK MOTOR CAR CO., Inc., York, Pa.

Agents Wanted in Unoccupied Territory




# Write for Our Advance 1910 Catalogue and Booklet—"*The Story of the Glidden Tour and the Moline's Perfect Road Score.*"

WE want you to read the phenomenal performance the Moline made, day by day, in this, the toughest endurance contest ever undertaken.

We want you to see how the Moline out-roaded, out-scored cars costing double its modest price.

We want you to get a practical, trustworthy idea of the actual serviceability, durability and efficiency of the Moline, for we feel that the Glidden Tour affords the buyer of an automobile with buying information that is far better than any demonstration one can get in the ordinary way of buying.

THE FINEST $1500.00 CAR ON THE MARKET

Here are a few points we call to your particular attention:

**The Moline covered the 2640 miles of this tour without a single displacement or hitch in any way whatsoever.**

**The Moline was the lowest priced car that made a perfect road score of the entire tour.**

**The Moline was the only car in the entire tour which carried no extra parts.**

While this does not tell the detail performance of the dependable Moline, yet in brief it tells a record of **actual road service, durability and dependability** superior to any of the contesting cars regardless of their cost, some of which sell for more than double the price of a Moline.

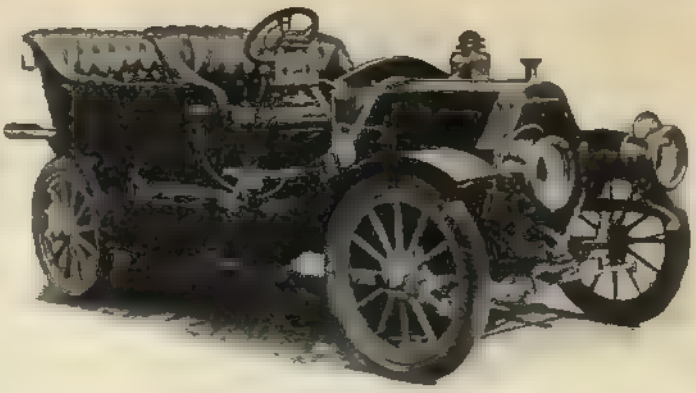
If you are looking for down-right merit, **proven efficiency** under the severest test; if you are looking for a car that is smart, classy, luxurious—that will give you the utmost satisfaction, the Moline will "Make Good," to the fullest degree—and the cost will be less than half, for the Moline Model "M" 1910 sells for only $1500 with full equipment.

It will certainly pay to look into the Moline before you buy. Ask for Advance Catalogue No. 37. Send today.

**MOLINE AUTOMOBILE COMPANY, East Moline, Illinois**

# CAR AHEAD!

Weight 1700 lbs



30 H.P. (Actual)

## RIDER-LEWIS "FOUR"

### The Biggest Little Car Ever Built

¶ In design, appearance and ability, the Rider-Lewis IV easily heads the list of popular priced cars.

**FEATURES:**

| | |
|---|---|
| Four Cylinders | Flexible Motor Supports |
| Valves in the Head | Rear Axle Gear Set, 3 Speeds |
| Magneto Ignition | Straight Line Drive |
| Thermo-Syphon Cooling | Light Weight |
| 32" x 3½" Tires | 100" Wheel Base |

**—Simplicity the Very Keynote of the Design—**

**WE ALSO MANUFACTURE THE EXCELLENT SIX**

(The Most Luxurious of Cars), Price. $2500

CATALOG ON REQUEST. AGENTS GET OUR PROPOSITION

**Price, $1050** **The Rider-Lewis Motor Car Co.**

(Fully equipped with Remy Magneto and full lamp equipment.)

Anderson, Indiana

Eastern Distributor:—H. J. Koehler Sporting Goods Co., 1709 Broadway, New York City

# Get A Mora
GOOD FOR YEARS

# 1910

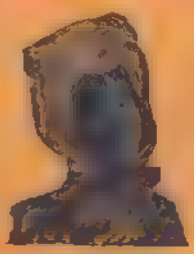
Light Four Roadster, $2500

**Mora "20," $1050**

THE 1910 Mora meets the requirements for a

## "Strenuously Reliable"

motor car, with an established reputation earned by performance. We refer the prospective buyer to other Mora owners as to the strenuously reliable capabilities of the Mora.



**PALACE SHOW EXHIBIT SECTION D**

MORA COMPANY

37 Mora Place, Newark, New York

New York Branch: Broadway & 52d Street

# *Don't Get the WRONG Warner*

# WARNER MFG. Co.

T. W. WARNER, PRES. & GEN. MGR.

## of TOLEDO, OHIO

THIS Company has no connection whatever with any other concern, either in the Automobile or parts manufacturing business, except our Muncie, Indiana, branch, the T. W. WARNER CO., manufacturing GEAR SHIFT LEVERS, TRANSMISSIONS, DIFFERENTIALS, and STEERING GEARS. Now booking 1911 contracts, but can handle a limited amount of 1910 business. $250,000.00 invested in machinery and tools. 75,000 square feet floor space. Capacity, 500 men.

## *The 1910 Speedwell "50"—$2500*

A car that sells in competition with the highest priced cars made.

This car is an ideal agency proposition because it meets the demands of the discriminating automobile buyer for **size, power, appearance, long service** and **all 'round efficiency** and because an extensive national advertising campaign is bringing the SPEEDWELL to the Public's notice everywhere.

## THE SPEEDWELL MOTOR CAR CO.

**60 Essex Avenue - - DAYTON, OHIO**

# San Francisco Branch

## For Bosch Magneto Company

**To keep pace with the remarkable growth of its business in the West, the BOSCH MAGNETO COMPANY has opened a Branch Office at 357 Van Ness Ave., San Francisco.**

**This office is supplied with a full assortment of the various types of BOSCH Magnetos (together with spare parts and fittings) for Motor Cars, Motor Cycles, Motor Boats, Stationary Gas Engines and Air Ships.**

**A corps of competent electrical engineers will always be on hand, and their services for consultation and advice on Magnetos and Ignition are to be had without charge.**

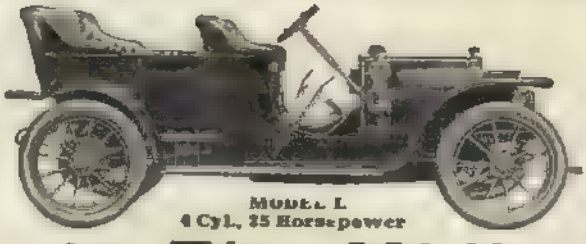
**The New Branch is Located at 357 Van Ness Avenue, San Francisco**

# BOSCH MAGNETO CO.

**223-225 West 46th St., New York  Chicago Branch: 1253 Michigan Ave.**



MIDLAND



MODEL L
4 Cyl., 25 Horsepower

# Investigate The Midland

You will never know what extreme values are open to the man who investigates until you learn the facts about the Model L "Midland."

The Model L "Midland" was a pilot car in the Munsey Reliability run—and the car had been driven 5000 miles before it entered the contest. It was a stock car not specially constructed for the event; yet it covered itself with glory all the way.

In the Philadelphia-Seattle relay race a Model L "Midland" was used between Dixon, Ill., and Mt. Vernon, Ia. It completed this run of 120 miles in 4 hours and 55 minutes without a mishap. This includes time waiting for and on board ferry at Fulton, while crossing the Mississippi. Compare this with showing made by other cars making up the team.

The great reserve power and perfect performance of the Model L under the most extreme severity are a constant source of wonder and gratification to those who have been wise enough to buy Quality rather than moss-grown reputation.

**MODEL L, 1910, $1750; with Touring Car, Toy Tonneau or Roadster Body**

A notable feature of this sturdy car is the unit power plant, and three point suspension. No strain or stress can destroy the perfect alignment of driving elements.

The flywheel and clutch are completely encased. This insures perfect alignment of the crank shaft, prevents unnecessary friction and results in a maximum of power being delivered to the rear wheels.

Cylinders are cast in pairs and have valves on opposite sides. The lubricating system is the same as used on the highest priced cars.

The springs are semi-elliptic front and rear—standard 3 inches wide.

All brakes are inside the drums, two sets on each wheel—dust proof and anti-rattle.

The Model L "Midland" is such a marvel of construction—so powerful, sweet running and easy to control—and above all so durable—that it is an easy car to sell to the man who makes comparisons.

MIDLAND MOTOR CAR CO., Moline, Ill.

# 1910

# Stevens-Duryea

# Motor Cars

¶ Original features thoroughly sound in practice—proved in prolonged tests by over one thousand of this model, have brought the superb four-cylinder twenty-four horse power MODEL "X" into the very front rank of high grade motor car construction.

*Price, including magneto, $2850.00*
*Top, with slip cover, $150.00*

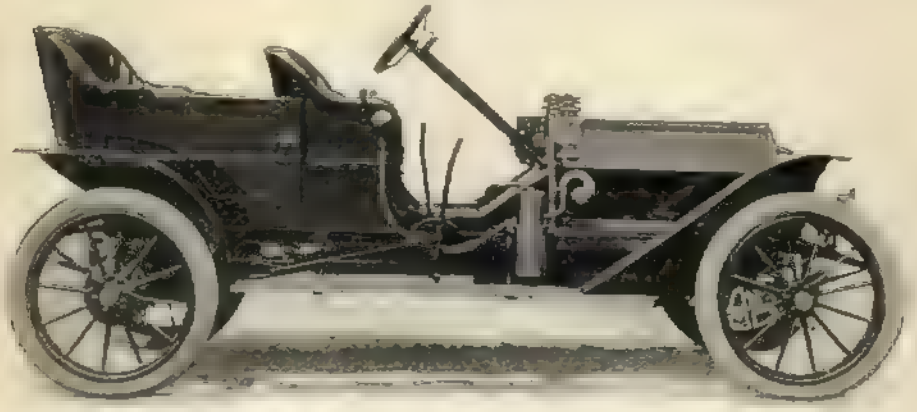
## Stevens-Duryea Company

CHICOPEE FALLS :: :: :: MASSACHUSETTS

Members Association
Licensed Automobile
Manufacturers

# The 1910 Cameron Sixes

The Cameron Car Co., of Beverly, Mass., will produce the coming season a complete line of 6-cylinder runabouts and touring cars, as well as a complete line of 4-cylinder runabouts and touring cars. The Sixes are all manufactured in the new plant at New London, Conn., where they are built complete from the ground up. It has always been the policy of the Cameron Car Company to manufacture all parts of their cars, even from the early days in 1902 and 1903 when they were a very small concern.



The 9[illegible] Cameron [illegible] 30 H P [illegible] wheel base, tread standard [illegible] in. Southern motor [illegible] gear. Price, roadster fully equipped $1500 [illegible] weight fully equipped 1700 lbs. 114 in. three speed and reverse selective Cameron change

The touring car complete as shown in the cut herewith sells at $1,500 as do runabout and roadster models of this type.

The motor is 6-cylinder, 4-cycle, 3⅞-in. bore by 3½ stroke; regularly equipped with Splitdorf high tension magneto, gear pump constant level oiling system and the valve arrangement is of the Cameron patented type which is the same design that they have been using for some years. The clutch is a self-contained cone, the engine base is of aluminum, split horizontally in the center, the cylinders are cast separately

To those familiar with the Cameron patented transmission it will be noticed that a slight change has been made in the system used on the 6-cylinder car. While the touring car weighs complete less than 1,700 pounds, still it is slightly heavier than any previous Cameron models, and with the increased power of the motor, of course, requires a heavier gear all around than the 4-cylinder cars. As will be noticed by reference to the illustration, power is delivered to the rear axle through spur gears, one great advantage of which is that the side thrust is taken away from the differential. The bevel gears never receive more than the engine pull and the reduction gears being back of the bevel, the heavy pull of the low gear is delivered by wide faced spur gears which cut down the friction considerably, and it is claimed that there is less loss of power in this transmission system as a whole than any other type of three speed transmission now being used. The bevel gears are held up firmly in mesh by a solid steel frame and run on adjustable ball bearings. In shifting gears the arch carrying the gear set is first thrown forward in the case, when the gear wanted is thrown in line with the spurs on the rear axle. When traveling crosswise in the case there is no strain against the gears to prevent their sliding over as they clear each other in passing, being brought sideways into line then brought into mesh with a rolling motion.

SPECIAL CHANGE SPEED GEAR.

The reverse stands idle except when the car is backing when it is dropped down from the top of the case between the large and small spur gears. The system is selective. The gears have very wide face and coarse pitch. The small gear on the cross shaft when brought into mesh with the larger spur gear on the rear axle gives low speed ahead. The second speed is obtained by meshing the large spur gear on the cross shaft to the large spur on the differential; and the high by meshing the large spur on the cross shaft with the small spur on the differential.

Gears and shafts are of chrome nickel steel, ball bearings annual type of very large dimensions. The gear case is aluminum and very easily disassembled. The drive is the same type which has always been used by Cameron that a single universal joint is placed directly back of the clutch, and a heavy driving tube or propeller shaft housing carries the driving strain to a point just back of the flywheel.

# Stevens-Duryea

## 1910 SIX-Cylinder Model Y Touring Car

*6-40 Horse Power*

**Unit Power Plant**

**Three Point Support**

**Patent Multiple Disc Clutch**

¶ STEVENS-DURYEA time-tried features are embodied in this car. In addition, the SIX-Cylinder Model Y has all improvements and refinements of standardized, accepted designs.

¶ Two independent systems of ignition.

¶ SIX CYLINDERS in higher horse-powers are not only Preferable, but Essential as well.

¶ STEVENS-DURYEA DEMONSTRATIONS will convince you.

## Stevens-Duryea Company

CHICOPEE FALLS :: :: MASSACHUSETTS

MEMBERS ASSOCIATION LICENSED AUTOMOBILE MANUFACTURERS

emergency brake is controlled by a ratchet retained pedal and is compensated by a single-tree device, the full width of the frame. This brake is also camel's hair faced, and applies by contracting on the rear wheel drums.

The side lever controls the two forward speeds, the reverse being by pedal. Spark and throttle are both controlled by levers, working on the stationary quadrant above the steering wheel.

The steering wheel is of wood, and the steering is reversible.

The gasoline tank is under the seat and possesses a capacity of from ten to twelve gallons

The wheel base is 92 inches and the tread 56. The weight is about 1,200 pounds, tanks empty, and the maximum speed is about 25 miles an hour. Prices range from $650 to $850, according to body and whether an air-cooled or water-cooled motor is fitted

## MAXWELL-BRISCOE AMBULANCE

The cut herewith illustrates the Maxwell-Briscoe Ambulance recently built by the Maxwell-Briscoe Motor Company, Tarrytown, N. Y. for the city of Newark, N. J

The wheel base is 126 inches. The material used in building the body is sheet steel, aluminum and wood. The length of the body in the clear is 6 ft. 7 ins. inside from front partition to inside of tail gate The cross width on inside on bottom is 38½ in. On top 43½ in. There are two sliding windows in front partition and two stationary windows on either side in front The frames are mahogany and the glass French plate beveled edge. The space on side in rear is left open. These spaces are provided with storm curtains, also drop curtains for rear end.

The inside is provided with a cot 6 ft. 4 in. long by 38 in. wide. This is made up on an ash frame 4 in. deep and is upholstered in black leather. The inside of the body is padded up to a point 18½ in. from floor. These pads are made to take out so as to make them easy to clean.

The cot is provided with a pair of ball bearing casters in front and a pair of pull-to handles in rear, and may be drawn out to a point 20 in. from rear end of body and is held fast by means of a hook and loop arrangement, making it convenient to remove the patient.

A folding seat 56 in. by 12 in. is built in on left hand side for emergency use. This seat folds downward when not in use, thus making the side flush.

A mahogany medicine cabinet built to hold all the necessary articles used in emergency cases is secured to front partition and extends the full inside width of body There are also two electric corner lights inside and a megaphone speaking tube for the physician to communicate with the chauffeur.

The tail gate is hung on two forged hinges and is held in an upright position with two spring catches. There is also a fold-up physician's seat in rear which extends across the body

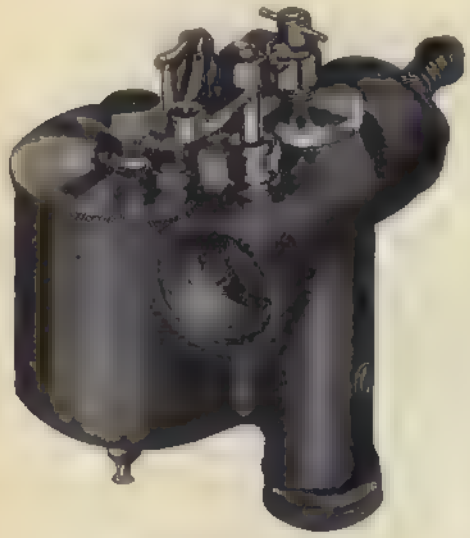
A factory, for the manufacture of motor trucks, is being erected in the "Midway district" between Minneapolis and St. Paul, Minn. When completed it will be occupied by the Dilver Manufacturing Company, of Mankato, Minn.

The R. L. Morgan Co., of Worcester, Mass., has recently been incorporated with a capital of $300,000 for the purpose of manufacturing the Morgan motor truck. It is said that 500 cars are to be turned out yearly. The officers elected are: President, Ralph L. Morgan; treasurer and general manager, Henry E. Whitcomb; vice-president, F. B. Durfee, and secretary, Alfred R. Grundelle. John R. Back, also of Worcester, will have charge of the production end of the business.

## THE "KELLY" CARBURETOR

The carburetor, illustrated herewith, is manufactured by John Kelly, 46th and Congress streets, Chicago, Ill.

It is made of red brass for 1 and 1¼ inch pipe size. The float acts direct, without levers and makes the valve tight regardless of the angle of the car or carburetor. The ball and socket point make a still more positive seating.



The "Kelly" carburetor

Quite a margin is left below the outlet opening in the float chamber for water or sediment and prevents the car from stopping at a critical time.

The priming and low speed air cup are adjustable and the needle valve acts as a spreader. There is an auxiliary air valve and independent adjustment of spring tension and stroke of valve

The primer is adjustable so as to operate from any point as is also the butterfly throttle valve. All screws on this carburetor are double locked

## THE "SPITZLI" AUTOMOBILE JACK

The "Spitzli" auto jack, a cut of which is shown herewith, is manufactured by the Spitzli Manufacturing Co., of Utica, N. Y.

The feature of the "Spitzli" jack is that it is operated by foot power eliminating all necessity of stooping over, except when placing or removing the jack. After the jack is placed it is operated by pressing down with the foot and then raising the weight of the lever by means of the toe, as shown by dotted lines in the illustration.

To lower the car the catch is reversed and the lever pressed down and allowed to rise again slowly by keeping the weight of the foot on the lever. When it stops

The "Spitzli" Automobile Jack

rising it is raised still further by means of the toe which adjusts it for another operation

This jack, when folded, is so compact that it fits nicely into one end of the average tool box. It is ready for use instantly. There are five different sizes, the largest of which occupies a space only 10½x3½x3½ inches.

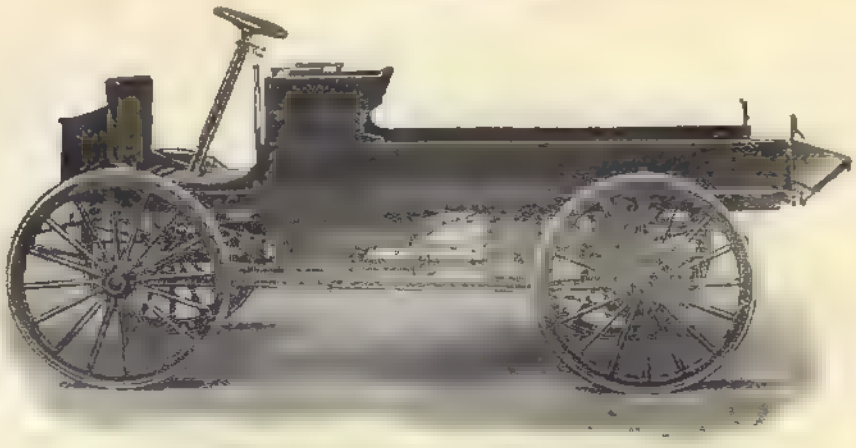
Another feature of the "Spitzli" jack is the extension ladder by which the lifting height can be increased or decreased When placed in position it is absolutely rigid. Like all other parts of the "Spitzli" jack, the extension ladder is made of the toughtest malleable iron, fully tested before it leaves the factory. The size of the extension jack is 11½x5x3.

A 10x6½x5 non-folding jack for garage use is also made. The "Spitzli" jacks weigh from 4½ to 7 pounds apiece, according to size, and list at from $1.50 to $4.00 for an aluminium bronze, baked Japan or gun metal finish.

## "FROST" AUTO GEARS AND TRANSMISSIONS

The Frost Gear & Machine Company, of Jackson, Mich., have enjoyed an especially rapid growth during the past two years, and have recently moved their business into a new plant in the eastern part of the city. A large amount of new equipment has been installed, including several generators, grinders, lathes, etc. They have also installed a very complete hardening plant, with furnaces and sand blasting outfit, and are now turning out rear axle and transmission gears for many of the largest automobile concerns in the country. They also do considerable contract work upon machine and engine parts, besides building complete transmissions to specification. Their entire product is marketed through the American Distributing Company, of Jackson, Mich

The Lunkenheimer Co., of Cincinnati, Ohio, informs us that the motor boat "Red Top II" had its 8-cylinder motor equipped with Lunkenheimer Type "C" generator valves which in spite of the icy temperature worked perfectly.



McIntyre Model 25 Light Delivery Wagon

## "McINTYRE" MODEL 251 LIGHT DELIVERY WAGON

The cut herewith shows one of the most popular sellers manufactured by the W. H. McIntyre Company, of Auburn, Ind. It is their Model 251 Light Delivery Wagon.

The motor is a double cylinder, horizontal opposed, 4¾ bore and stroke, giving 18 H. P. The transmission is of the planetary type, giving two speeds forward and one reverse. The drive is by chain to both rear wheels. Contracting band brakes are fitted to both rear hubs. The steer is by wheel and the spark and throttle levers are on top of the steering post. The high speed and reverse are operated by side lever and the low speed and brake by pedal. Mechanical lubrication is employed; the carburetor is of the float feed type. Ignition is by the jump spark system, using dry batteries. The frame is 2x2x¼ in. angle iron, hot riveted, 32 in wide by 112 in. long. Four full elliptic springs are fitted, 1½ in. wide, 5 leaves in front and 7 in rear. The wheels are 34 in. Sarven pattern. The axles are fitted with roller bearings. The front axle is 1⅜ in. square and the rear axle 1½ in. square. The wheel base is 86 in. The tires are solid rubber 1½ in, in front, 1¾ in. rear. Outside dimensions of body are 115x48 in., inside back of seat 68x45 in. The panels are 8 in. deep inside. The body is ironed on top all around and strap irons are fitted on bottom. A drop end gate is provided. A tool box is placed on the dash. The capacity of the machine is 1,200 pounds and the price $750.

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Six Cartercar taxicabs have been put into service upon the streets of Tacoma, Wash., by the Pacific Car Company.

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A new taxicab service of six Alco taxicabs has been started in Baltimore, Md., by the Stewart Cab and Auto Company.

## "QUICKER SERVICE AT SAME COST"

Such is the statement made by the Columbia Grocery Company, of Indianapolis, Ind., who has been using a commercial motor car in delivering groceries for the last two years.

This concern has in service a 24 H. P., 4-cylinder Rapid motor truck made by the Rapid Motor Vehicle Co., of Pontiac, Mich., listing at $1600. Covering a radius of about five miles this car makes five trips of about thirty calls each. A load of about 800 pounds is carried each trip. Formerly, two single delivery wagons were used, each making three trips of twenty-five calls each under a load of about 600-700 pounds. The first cost of the motor truck was about three times that of the two horses, wagons and harness formerly used, but the cost of maintainance is slightly less and the service much quicker. The monthly cost for both delivery wagons was about $130, which is the average monthly cost of the motor truck. The car is kept at a garage at a storage rate of $15. The operator is paid about $50 per month, the cost of gasoline and oil averages about $35 per month and the monthly cost of repair work and parts is $20.

The Columbia Grocery Company states that all requirements, except the desired lower cost, are fulfilled. The company thinks the investment involved in installing a motor truck is too great, considering the quick depreciation, as the life of the car is estimated to be only about five years. They have had no trouble whatever in securing competent drivers, and the most needed improvement suggested by this company's experience is better working and simpler motors and a lower first cost.

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A one-ton Baker electric truck is being used by the Fairfield Dairy Company, of Montclair, N. J.

## 1910 COUPLE-GEAR TRUCK

The Couple Gear Freight Wheel Co., of Grand Rapids, Mich., have incorporated in their new machine all of the "couple-action" and "couple-gear" principles that have been incorporated in the battery driven machines since their beginning. In this type, however, they have substituted the motor generator set in place of the battery.

The power on a 3½-ton wagon consists of a 4-cylinder, 4-cycle, 5-inch bearing engine and 12½ K. W. generator direct connected and carried on a sub base which has three-point suspension within the

main frame. This outfit generates current as needed which is conducted to the controller and from there to the motors in the wheels.

SIMPLE CONTROL.

The controller is built with two changes of speed, and all other changes are made by increasing and decreasing the speed of the engine which is controlled entirely by an inward motion of the left foot, leaving the hands free at all times to operate the steering device. The speeds of the car vary from 7 to 15 miles per hour and over all ordinary roads it is possible to use them in connection with a trailer, handling the full rated load capacity upon the truck and a like amount upon the trailer.

TESTS MADE WITH THE COUPLE-GEAR TRUCK.

We give herewith a report of a 7-ton load delivered from Buffalo to Tonawanda by the Dold Co., also report covering cross country trip made from Grand Rapids to Battle Creek with one of the 3½-ton machines.

The Dold Company's truck carried a 7 ton load, 14,000 pounds weight of load, and 4500 pounds weight of trailer. The number of deliveries, mostly at retail markets, were 28: total mileage, 38; average speed, loaded, to first stop, 8.5 miles per hour; average speed, entire trip, 8.14 miles per hour; 11 gallons of gasoline were consumed and one quart of oil; miles per gallon of gasoline, 3.45; total time, 7 hours 32 minutes; running time, 4 hours 41 minutes; running time delivering in Tonawanda, 1 hour 59 minutes; maximum voltage, 125; average voltage Buffalo to Tonawanda, 125; average voltage Tonawanda to Buffalo, 110.

In the afternoon of the same day 25 deliveries were made to city markets covering a distance of 17.7 miles in the running time of 2 hours 19 minutes, and total time of 4 hours 45 minutes.

The cross country trip was made after a severe rain and the roads encountered for the first 20 miles were very bad. The tread of this machine was 68 inches, making it necessary for the machine to cut its own way through the mud, sand and other obstructions that were continuously met with. The entire trip was made without a mishap of any kind and at no time was there a lack of sufficient power to take the machine through with a good road.

The total distance was 144 miles. From Grand Rapids to Kalamazoo the distance was 48 miles. Running time 5 hours 20 minutes; miles per hour, 9; gasoline consumed, 14½ gallons; miles per gallon, 3.31; average voltage, 125; average amperes, 83.

Twelve gallons of gasoline were used in a half day demonstration at Kalamazoo. The 24 miles from Kalamazoo to Battle Creek were made in 2 hours 16 min. A half day demonstration was also given at Battle Creek. During the last half day demonstration 11½ gallons of gasoline were used. The return trip to Kalamazoo was made in a running time of 4 hours 30 minutes, total time, 4 hours 40 minutes; miles per hour, 10.75; gasoline used, 5 1-3 gallons, and total amount of oil per trip, 4 gallons.

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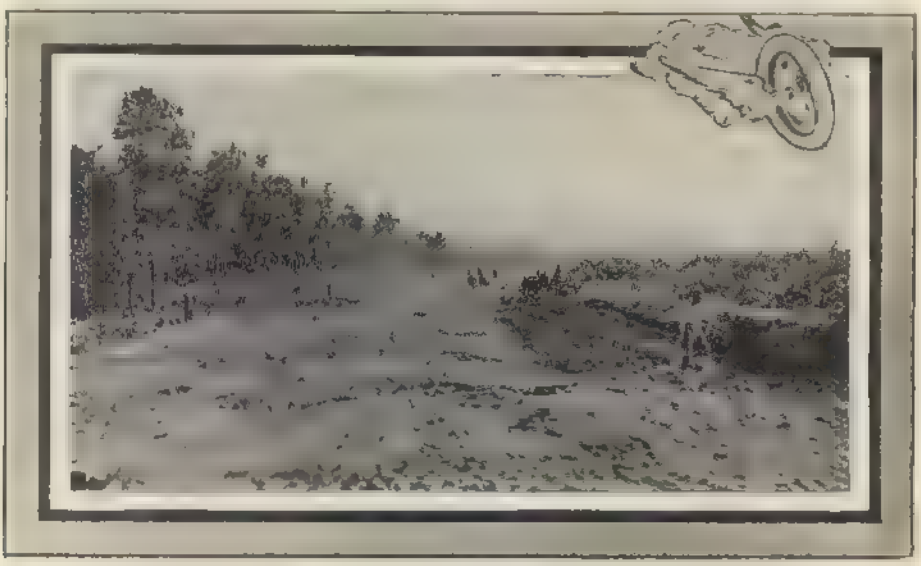
The city of Pomona, Cal., has put into commission a motor chemical engine, and the city of San Diego, not very far from Pomona, is about to put into service a similar outfit.

# Atlanta's Speedway

The Sunny South not to be outdone by the Middle West has now in progress of construction a two-mile speedway, which it is claimed will cost $2,500,000. This new course for lowering records is situated about seven miles from the center of Atlanta, Ga., and is backed by Asa Chandler, Jr., E. M. Durant and several other well known business men of Atlanta. The tract of ground includes over 290 acres and there are now at work about 1,000 laborers and 100 teams, in addition to steam shovels and dummy cars on tracks



View showing the teams at work on the back stretch of the $2,500,000 Automobile Speedway, now being constructed at Atlanta Ga. This speedway will be two miles in length, with [illegible] banked turns 60 feet in width, admitting of the highest speeds. The center field will be fitted for [illegible] and aeroplane competitions.

The track or speedway is to be two miles in circumference, one hundreed feet in width on the home stretch and sixty feet on the bank's edge or six degrees and these banks will be shaped scientifically and in accordance with modern models upon which motorcycle tracks are formed. The surfacing on a red earth basis will be of Augusta Chirt well mixed with a special oil. The track will admit of two miles a minute with no dust.

Fifty cars it is claimed may be started on this surface and compete safely. The removal of 300,000 cubic yards of dirt will be required to construct the speedway and level down all the hills to bring into view of the stand every inch of the track, which at some points will be fifteen feet above the surrounding land at the pole. At such places a bank will be built to the land below for safety and the backs of the banks will be slanting also. No fences inside or outside the track will also lend an air of safety.

Twelve or more fire proof garages and a machine shop with power will be erected within the enclosure and the living rooms of the drivers will be above the garages. In addition there will be accommodations for the track manager, the superintendent and officials and there will be a club house, as well as a complete water works and lighting plant. It is claimed grand stands to seat over 30,000 people are soon to be erected and in such positions and at such heights as to give a general view of the entire course. Restaurants and a press stand and parking spaces for a large number of cars will be provided and made accessible by a good road extending from the street under the upper bank and to the center of the enclosure.

The Atlanta Speedway will probably be ready about the middle of October and will be opened November 9th with a tentive programme of short distance races and speed trials, this being the time of the National Automobile Show in Atlanta, thousands of motorists from all parts of the country are expected to be in the "Gate City" of the South.

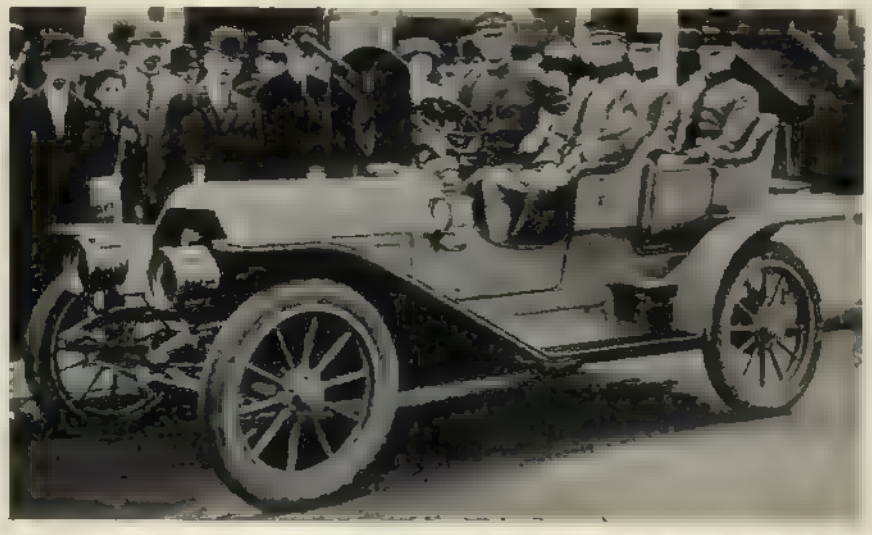
## INCREASE ON AUTOMOBILE DUTY

The passage of the recent tariff bill among other changes gives an increase on automobiles and parts of 5 per cent., making the tariff 50 per cent. ad valorem. This is somewhat unexpected, as the importers were making a strong fight to have a reduction made.

## CAR FITTED WITH RAPID-FIRE GUN

The Cadillac Thirty has been chosen for the work of proving to United States army officials at Washington the adaptability of the motor car to war-time duty

The Northwestern Military Academy, Highland Park, Chicago, has placed its order with the Cadillac dealers in Chicago for a Cadillac Thirty demi-tonneau, fitted with a Colt automatic rapid-fire gun. The armament is mounted directly over the dash as shown, so that it can be operated by the man who rides with the steersman. In the rear, additional ammunition or men will be carried The car will be painted battleship gray.



Mounting the Colt automatic rapid fire gun capable of 480 shots per minute on a Cadillac Thirty, equivalent in firing power to one company of infantry

The Northwestern Academy has been interested in experiments of this sort with automobiles since 1906. The gun mounted on the car has a firing capacity of 480 shots a minute—the equal of one entire company of infantry. An automobile thus equipped would be admirably adapted to coast defense work and in serious riots.

These experiments are in line with those made in the German army, which proved so successful that an equipment of armored motor cars has been provided.

With the strides made in aerial navigation and the possibilities opened up by the airship as a means of attack, army officers are looking closely into the question of adequate defense and believe the armed automobile will meet the requirements.

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The Kos Mos Electric Runabout Co., formerly of New York City, is erecting a factory in Detroit, Mich., for the production of their two-seated runabouts. The plant will be finished in two months and 100 men will be put to work.

## MAXWELL-BRISCOE CO.'S NEW PLANT

Starting at Tarrytown, N. Y., about six years ago, the Maxwell-Briscoe Company is now operating three separate factories with over 45 acres of ground and an equipment representing more than $1,500,000 It was recently announced that the company had made another acquisition, purchasing the plant of the Atlantic Rubber Shoe Co. at Canton, near Providence, R. I.

The new factory comprises about eleven acres with a large three-story building This plant was erected five years ago and is equipped with a 400 H P plant With these additional facilities the New England factories will produce a minimum of six thousand Maxwell cars. The factory at Tarrytown, N. Y., which absorbed the old hand drill plant some five years ago, will produce next season at least four thousand automobiles. The Newcastle factory, which is said to be the largest automobile plant in the world under one roof, with the three additions which are now completed, will turn out in the vicinity of twelve thousand cars for 1910. This will make the combined output for the Maxwell factories for the season of 1910 total up to more than 22,000 automobiles.

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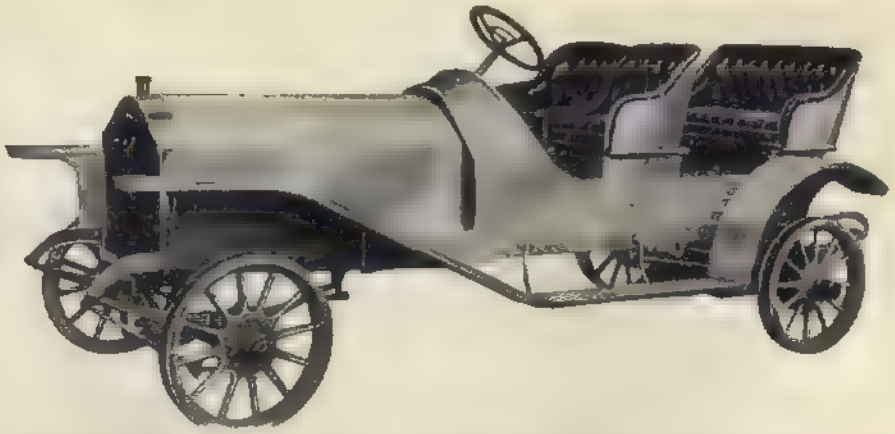
K. T. McKinstry has severed his connection with the sales department of the automobile end of the Columbus Buggy Co., Columbus, O., and has taken the management of the automobile business for E. D. Crane & Co., 44-46 Madison Street, Atlanta, Ga. This concern will handle the Firestone Columbus, Columbus Electric, Regal, and Hupmobile in central and north Georgia.



The new "Borbein" four-passenger roadster body and running gear complete, ready for power plant; built to take a 4 cylinder motor. Wheel base, 120 ins.; standard gauge 56 ins. wheels ready to take 34 in. x 4 in. tires Price with one coat of paint, including radiator hood and wheel steering device as shown, $598. F. O. B. Factory

## "BORBEIN" FOUR-PASSENGER ROADSTER

The Borbein Auto Company, of 2109-2111 N. Ninth Street, St. Louis, Mo., are placing on the market the four-passenger roadster shown in the accompanying cut. The wheel base is 120 inches and the tread standard, 56 inches. The artillery wheels have quick detachable steel rims and are ready to take 34x4-inch pneumatic tires. The front axle is I-beam style, 2¾ inches high with annular ball bearing spindles. The rear axle shaft drive has a ratio of 2½ to 1, with internal, also external brakes near the rear wheels. The body is built with seats low down and high cushions, upholstered with dark green leather. A metal shield is fastened back of the dash, and extends to the rear part of the front seat. Reinforced metal fenders and running boards are all fastened in place. This car is built for a four-cylinder motor. The price with one coat of lead paint, including radiator, hood and wheel steering device as shown, is $598, f. o. b. factory. This firm builds all styles of running gears, bodies, axles and wheels for the trade

## 1909 "NATIONAL" WINDSHIELD

The accompanying cut illustrates the windshield manufactured by the National Auto Top Co., 1904 Broadway, New York, in position for use in rainy weather. This is a new feature on this shield and allows the lower end of the upper section to be thrown out, protecting the chauffeur from the rain but allowing an unobstructed view of the roadway ahead

The National is made of the best polish glass encased in felt inside the genuine mahogany frame. The glass does not touch the wood at any place, avoiding any danger of breaking. The frame comes unstained in three shades, light, dark or medium. All attachments are of solid cast brass, finely polished, and the stay braces are of polished brass tubing.

This windshield is easily adjusted from the seat. The upper section is swung into

The 1909 "National" Windshield, showing "rain vision" attachment in use

any position or down back of the lower half and then tightened by a thumb screw at either end.

The National is furnished to fit any car. It lists at $40 00, attached to the car at the company's factory or boxed ready for shipping.

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Adam Cook's Sons, 313 West street, New York, are placing on the market Albany Grease made in seven different densities designated by number, beginning with 0 and including 1, 2 and 3, and the X, XX and XXX, these being suited to conditions and temperatures, for motor vehicles or motor boats. The difference is simply in consistency. The grease is packed in 1, 5, 10, 25 and 50-pound cans and kegs containing about 125 pounds.

## TRADE CHANGES

The New England branch of the Auto Improvement Co., manufacturers of "Ever-Ready" speedometers has moved and is now located at 284 Columbus avenue, Boston Mass

Breig Bros. Auto Co., has moved from Clinton, Mo., to 613 S. Ohio street, Sedalia, Mo., where it is operating a garage in connection with its repair shop

J. B. Collins and S. T. Drake have purchased the George A. Kuntz garage at Twenty-second and Cottage Grove avenue, Des Moines, Ia., and will conduct the business under the firm name of Collins & Drake.

The Hartford Auto Parts Co., of Hartford, Conn., has increased its capital stock from $50,000 to $100,000 and will in the near future increase its plant.

The Heinze Electric Co., of Lowell, Mass., recently completed an extensive addition to one of their plants

The Maxwell-Briscoe Motor Co. is having two large additions built to its factory. One is 722 feet by 60 feet while the other is 36 feet by 150 feet. When completed these additions will furnish room for 800 more men

The Goodwin Motor Co., of New Castle, Ind. has moved its headquarters from the corner of Twelfth and Race streets to the Jennings Building on Race street, between Fourteenth and Fifteenth.

The G-L Economizer Co., makers of G-L Economizers, have moved from 1412 Times Building to the Thoroughfare Building, 1777 Broadway, New York City

The Keystone Motor Car Company, 215 North Broad street, Philadelphia, Pa., is having three stories put on its present building.

The Holyoke Auto Supply Co., of Springfield Mass., has moved from Essex street to new quarters at High and Cabot streets

Joseph Buch and Nicholas Snyder have purchased the taxicab business of David Swith at Greenwood avenue and Chambers street, Trenton, N. J. They will operate under the firm name of the Trenton Taxicab Co.

The Waukesha Motor Company, Waukesha, Wis., is building an addition to its factory. The addition will be 100x150 feet, with a saw tooth roof, construction to be of steel, concrete and brick, located on the main lines of the Chicago, Milwaukee & St. Paul railroad and the Chicago & Northwestern.

## FIRES, JUDGMENTS AND FAILURES

A fire of mysterious origin recently destroyed the garage of the Chicago Taxicab Company, 1823 to 1826 Michigan avenue, Chicago Ill., destroying eighteen new motor cars and causing a loss of from $50,000 to $60,000.

The Monarch Motor Car Co., of Chicago, Ill., was recently declared bankrupt and the American Trust and Savings Bank was appointed receiver. Liabilities are said to exceed $50,000 and the assets half that amount.

On June 9, a fire at the garage of Straight & Roberts, 57 Maple street, Chicago, Ill., destroyed four automobiles and imperiled the lives of eight persons who were in the upper part of the building.

The office, accounting department and retail salesroom of the Auto Tire Security Company, manufacturers of "Kemlzite," 1231 Michigan avenue, Chicago, Ill., were recently slightly damaged by fire.

The Bruns Garage at Hollidaysburg, Pa., was recently totally destroyed by fire.

The Kettle Cove garage in Manchester, Mass. was recently totally destroyed by fire. The loss was about $5000

Hamilton M. Dawes has been appointed temporary receiver of the involuntary bankrupt International Generator Co., of New York City

An involuntary petition in bankruptcy was recently filed against the Gearless Motor Car Company of Rochester, N. Y The claims of the creditors amount to about $2000

H L. Carrish who has been conducting the Royal Garage at 1639 Oak street, San Francisco, has filed a petition in bankruptcy, with $2000 in liabilities.

## CADILLAC PLANT SOLD TO GENERAL MOTORS CO. FOR $5,000,000

After negotiations lasting several weeks, a deal was closed whereby the Cadillac Motor Car Company was acquired by the General Motors Company. The consideration was very close to $5,000,000

The Cadillac Company is one of the largest in the country, employing at the present time in its various departments 3,400 skilled mechanics, with an output of 10,000 automobiles for the calendar year of 1909.

### NO CHANGE IN POLICY.

Just as we go to press we receive assurance from W. C. Leland, Secretary of the Cadillac Co., as follows: "We have the written assurance of the purchaser that the Cadillac Company will continue to carry on its business as though it were an entirely independent organization. It is not tied to any company, or to any policies. On the contrary, Cadillac standards, Cadillac policies, Cadillac methods, and the entire Cadillac organization will be carried on without alteration, and exactly as though the transaction recently consummated had never taken place. Mr. H. M Leland will continue to have full charge of the management of the company.

"We are entering into these new relations in good faith, and with the full expectation and belief that the statements above made will be actually carried out."

## NEW INCORPORATIONS

Camden, N J., Regal Tire & Rubber Company to manufacture auto tires, etc., capital $250,000

Denver, Col., Trott Automobile Company, capital $100,000.

Logansport, Ind., Western Motor Company, increase capital stock from $250,000 to $400,000

Manhattan, N Y., Gustead Motor Vehicle Co., to manufacture autos, capital $100,000

Springfield, Ohio., Yost Gearless Motor Company, to manufacture autos, capital $25,000

St. Joseph, Mo., Uhler Motor Co., to manufacture invention on internal combustion engines, capital $100,000.

## TRADE PRINTED MATTER.

A handy and complete book of maps and descriptive routes has recently made its appearance in the "Penn Jersey Auto Road Guide and Route List." The book contains 66 pages in which are authentic descriptions for reaching practically every town in the two States indicated in the title, including the State of Delaware, which has been added this year. It also contains road maps of each State and a list of over 100 reliable hotels and garages. It is published by the W Numeviller Co., 711 Walnut street, Philadelphia, Pa., and sells at $1 00 per copy.

"Tale of a Tour and Worth of a Magneto Told by the Kodak" is the title of a neat little leather bound booklet recently issued by the Remy Electric Company, of Anderson, Indiana The booklet is replete with photos taken on a two months' and a half tour through Florida's swamps in a car equipped with a "Fool-proof" Remy High-Tension Magneto.

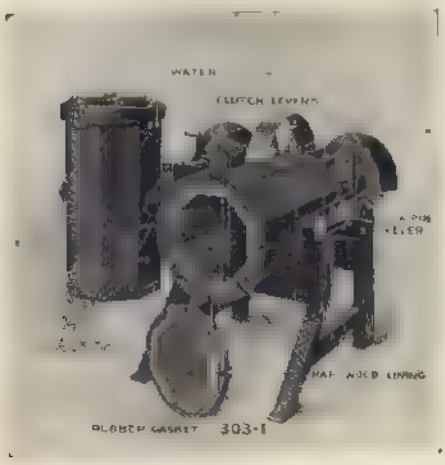
The Electric Storage Battery Co., of Philadelphia, Pa., has just issued a very neat booklet giving a sketch of the development of the "Exide" and "Hycap-Exide" Batteries. A

of spur gears connected to bevel gear by shaft with universal joints

There being a small number of joints and all gears and shafts being large, insures a very steady positive drive of the table in unison with the cutter, which is very essential for accurate work. Usually one only of the spur gears is changed when the number of teeth to be cut is changed. The vertical feed is by means of a pawl and ratchet operated through a reducing gear by an eccentric on the worm shaft. The feed may be changed without stopping the machine by shifting the button on the bell crank at the top of the machine. A trip automatically stops this feed when the hob has finished the gear.

## THE "BAIRD" STEEL BALL TUMBLING BARREL

The accompanying cut illustrates a machine designed for the purpose of imparting a highly polished surface to such articles as small nuts and washers, chains and flat metal or stamped articles of any kind The articles are in this machine along with steel balls, which burnishes them before plating or polishes them afterwards.




The "Baird" Steel Ball Tumbling Barrel

The machine is exceedingly simple to operate. The barrels are pivoted near the center of their length and are positively held in the fork shaped bearing in a horizontal or operating position by a lock pin which engages a recess in one side of the barrel near the bottom end.

A slight push on the lock pin lever shown, instantly disengages the pin, when the barrel can be tilted. Simply loosening the cover bolt nuts, and throwing back the bolts, enables the cover to be removed and the barrel can then be instantly tilted or turned bottom up to dump the articles, then reversed and refilled. The entire operation takes but one or two minutes. The barrels are of cast iron, lined with maple wood, which when worn out can be easily replaced, thus preserving the iron barrel. Each barrel is independently driven by a clutch engaging the larger gear, so that one barrel can be emptied and refilled while the other is in motion. A rubber gasket on the cover completely seats the barrel, making it water-tight. After withdrawing the locking pin the barrel can be tilted to any angle for the purpose of examining goods, turned bottom up to dump or reverse to again fill with goods. The specifications of the machine illustrated are as follows: Size of barrel (inside) 10½x24 inches long; clutch pulley 20 ins. diameter by 4 ins. face; floor space, 46 ins. by 57 ins.; and net weight 1300 lbs

This machine is manufactured by the Baird Machine Co., Oakville, Conn.

## THE "CANTON" PORTABLE HOIST

The Canton Foundry & Machine Company, of Canton, Ohio, is manufacturing the portable floor crane and hoist illustrated herewith.

This device will be found very useful in the automobile assembling room for the purpose of lifting an automobile bodily, either from the rear end or front, and high enough that a man can work under it, or for lifting engines, etc., from the chassis

The "Canton" Portable Floor Crane and Hoist

and conveying them to any part of the machine shop It is also used extensively for placing heavy castings between lathe centers, etc.

The peculiar frame construction of this device allows it to go into every nook and crook of a factory, often lifting and conveying heavy pieces in limited space where there is not room for more than one man. It is constructed of cast iron and steel and has roller bearing wheels. This hoist is made in eight sizes No. 1 has a capacity of 3000 lbs. It is 9 feet 8 inches high and has a 4½ foot lift. The list price is $100. No. 8 which is 12 feet 6 inches in height and has a 11 foot 3 inch lift, lists at $200.

# The Chase "Model F" Surrey

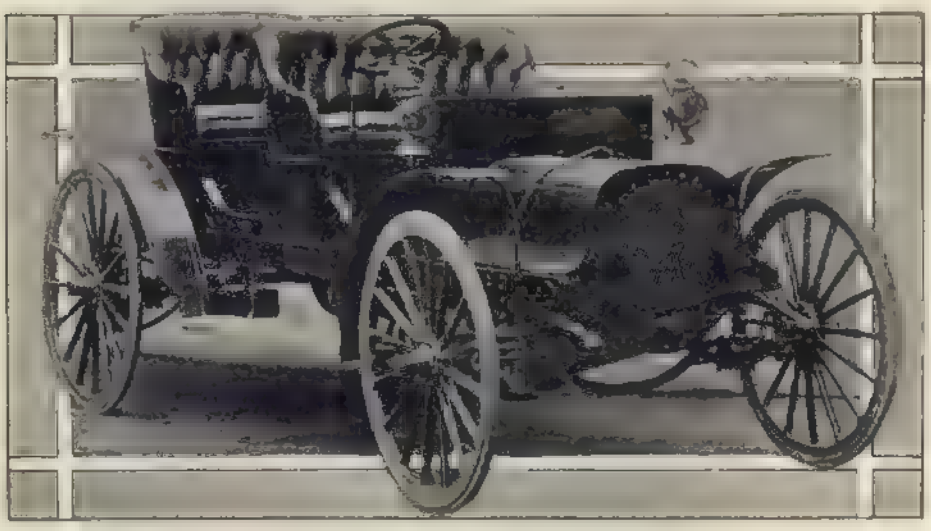
The Chase Motor Truck Company, of 332 South West Street, Syracuse, N. Y., has placed on the market a new car, known as the "Model F" Surrey. It appears as the result of the constant demand for a combination pleasure car and light business wagon. The "Model F" is constructed along the standard lines used in Chase trucks with a few additions and alterations necessary to adapt the car for the carrying of passengers. It is designed for use as a runabout or 4-passenger surrey as desired. The rear seat is detachable and when removed leaves a large space behind the front seat which allows for the carrying of miscellaneous articles of any kind making the car especially useful to traveling salesmen, enabling them to cover a large number of towns each day and carry their samples or other luggage with them on the rear platform. The high wheel construction with the solid tires together with the great reliability of the 2 cycle valveless motor makes this car peculiarly well adapted for this use both for its low operating cost and its great reliability. Telephone and Electric Light Companies will find this model of great value to their trouble men who have to cover large areas and have to carry some equipment with them. Farmers will appreciate the runabout for an errand wagon and the added rear seat for pleasure driving with their families.

The chassis contains the usual 3-cylinder, 2-cycle, air-cooled Chase motor rated at 15 H. P. with 3¾ in. bore and 4 in. stroke. The motor is placed under the hood and connected directly to the enclosed planetary gear, which runs in oil and gives two speeds forward and reverse. The drive to the rear wheels is by two side chains.

Ignition is by Atwater Kent Unisparker.

The lubrication is secured by placing the oil in the gasoline tank.

Spark and throttle levers are placed on the steering wheel. The steering gear is the irreversible worm and nut type.



The Chase Model F" surrey type 5 passenger detachable rear seat wheel base, 100 inches, tread standard, 56 inches, tires, 40x1⅝ ins. side wire solid motor, 15 H. P., 3 in pr 2 cycle, 3¾ in. bore, 4 in. stroke, air cooled, lubricating oil placed in gasoline tank, no other ignition Atwater Kent Unisparker; transmission, planetary type, two speeds forward and reverse, drive by countershaft and axle chains, brakes, Raymond type on rear wheels; springs all full elliptic, spark and throttle levers on steering wheel, weight, 1500 lbs. Price, $900 F. O. B. factory; canopy top extra

The wheels have 1¼ inch spokes, are 40 inches in diameter and are shod with 1⅝ inch side wire solid rubber tires.

The front wheels and the rear axle run in ball bearings. The transmission runs on ball and roller bearings.

The springs are full elliptic both front and rear

The main frame is of wood construction re-enforced with angle iron.

This car is geared to the maximum speed of from 20 to 25 miles per hour, the 3-cylinder giving the same smoothness as the 6-cylinder 4-cycle engine and makes the car a strong hill climber on high gear and very flexible in its control. The finish both in paint and workmanship is of the very highest grade.

The "Model F" weighs 1500 pounds and lists at $900 F. O. B. factory. A folding canopy top, if desired, is furnished extra

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The date of the National Show to be held at Atlanta has been changed from November 27-December 4, to November 6-13.

# HERRESHOFF

## To Increase the Output of New Series of Cars

The Harry S. Houpt Company has just concluded arrangements with the Herreshoff Motor Company whereby a more effective co-ordination between the factory and the sales organization will be secured The change will materially increase the factory production and enable the Houpt Company to extend its distributing field in new territory. The factory will be operated all summer in an effort to keep pace with the insistent demand for the smart, light car of class.

The first series of cars have been sold in a restricted territory. The new series of cars are now ready and it is intended to establish at once new connections in districts in which no representative has yet been appointed. Immediate deliveries of demonstrators can be made of the further refined new model.

In the past six months applications have been received from more than 500 agents who desired to handle

## The Herreshoff Car

Owing to the limitation of production, the Houpt Company has been compelled to confine its distribution to a few centres. It is intended under the new arrangement to extend this distribution, reassigning territory and establishing agencies in districts in which it has not been represented.

No car that has ever been introduced has obtained a wider prominence in the first year of its manufacture than the Herreshoff Car. The reason for this has been that it sounded a new note that accorded with popular demand, set a new standard in motor car construction.

It is the first car that has been built as a light car of the same excellence of material, with the same careful workmanship and proven mechanical principles as characterize the big and costly cars.

The majority of the cars sold in New York City are in the hands of men who have owned and driven cars that rank first among American automobiles, men who know what a motor car should be.

For information regarding agency territory, address Sales Manager K.

## Harry S. Houpt Co.

**Broadway and Sixty-eighth Street, New York City**

**Detroit Office—Harper and DeQuinter Sts**

## AUTO CHEMICAL FOR BRISTOL, CONN.

About six weeks ago the Bristol Fire Department, of Bristol, Connecticut, received its new auto chemical manufactured by the Pope Mfg. Co., of Hartford, Conn. For a brief time after its arrival it was given a test, climbing the hills of the town, loaded down with selectmen, fire commissioners, newspaper men and prominent citizens.

Pope-Hartford Auto Chemical recently installed by the Bristol Fire Department, Bristol, Conn.

The machine is here illustrated and it shows one of the several types that the Pope Company is prepared to turn out and the arrangement of the equipment on this machine is according to the specified contract.

The motor and chassis is of Pope-Hartford construction with special fire department frame, hot riveted. The wheel base is 118 inches. The horse power is 40-50. Tires are 34x5 inches. The specified speed is 35 miles per hour, but a greater speed can be attained if necessary.

The fire equipment consists of a 40 gallon chemical with extra jar and holder and connection for 2½ inch water hose. The metal hose basket contains 250 feet of ¾-inch hose, and the body has a capacity for 1,000 feet of 2½-inch hose. There are two 15 feet ladders, two 3 gallon hand extinguishers, two pickhead fire axes, several firemen's lanterns, a door crowbar, and a 18 inch gong. The lighting is similar to that employed on pleasure automobiles, but an extra gas tank in addition to the one attached to the wagon is supplied. Lighting—2 acetylene headlights, 2 oil side lamps; 1 oil tail lamp, 2 Prest-o-lite gas tanks (one attached).

Joseph Huckins, Jr., H. R. Connor and C. R. Riggs, all of Oklahoma City, have incorporated a taxicab company with a capital stock of $10,000

It has been calculated that the cost of operating a 26-passenger horse-drawn 'bus similar to those used in London is 16 cents a mile, counting 63 working miles to a day, while the cost of a modern 34-passenger gasoline motor 'bus is only 18 cents per mile, counting 120 miles to a day.

Read the August "1910 improvement number" If you want to know what the Car and Parts Manufacturers are doing for the 1910 season

A runabout converted into a delivery car is being used by William Bierbaum a rural mail carrier at Wausau, Wis., Route No 4. Although there are eight carriers using autos in southern Wisconsin, this is the first car to appear in the north.

# THE COMMERCIAL MOTORCAR CO.

INCORPORATED 1905

TIMES BUILDING

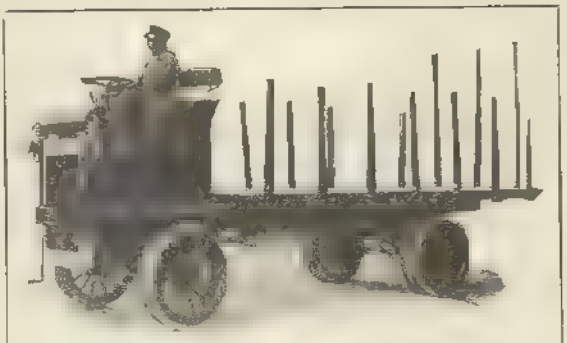
NEW YORK, N. Y.

COMMERCIAL MOTOR VEHICLES OF EVERY SIZE AND TYPE, BOTH GASOLENE AND ELECTRIC.

AUTOMOBILE DELIVERY AND TRANSPORTATION SYSTEMS INSTALLED COMPLETE.

OUR NEW CATALOGUE IS READY FOR DISTRIBUTION

# A Chance for the DEALER



*Five Ton Truck just shipped to the R. A. McKinnon Co., Little Falls, N. Y. Takes the place of three teams and two men. Cost for up-keep same as one team. Sixty horse power, four cylinder motor.*

YOU know how much—or little—you make out of your repair department as a dealer in pleasure cars. You know how many whims and fancies you have to meet in selling them.

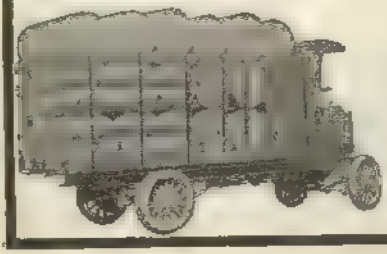
I want to introduce you to a business that has all the possibilities, as to volume, of the pleasure car trade, with less selling expense and practically no repair bother.

# "American-Trucks" (4 Cyl.)

can be sold in any city. The demand is increasing every day. The dealer who gets the agency **now** is slated for a good, profitable, growing business.

**American Motor Truck Co.** E. B. Olmstead, Vice-Pres. Lockport, N. Y.

# Rapid Commercial Power Wagons



offer greater money-making possibilities to the live agent or business man, with financial backing, than any other line. Rapid Commercial Power Wagons are built in sizes from ½ to 6 tons capacity, for any line of business. Every user of one or more horses represents a prospective buyer. See the possibilities now? Write today for catalog and agent's prospectus.

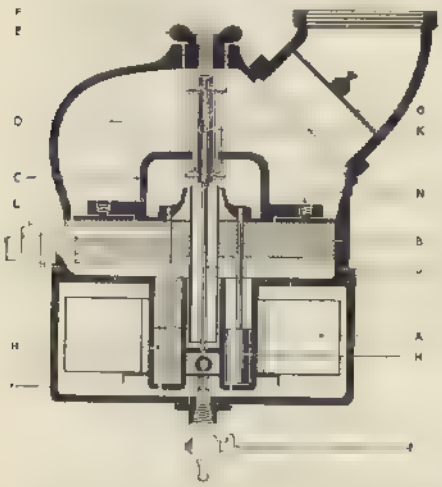
RAPID MOTOR VEHICLE COMPANY

211 Rapid St., Pontiac, Mich., U. S. A.

## THE "DURYEA" CARBURETER

The accompanying sectional view shows the Duryea carbureter, manufactured by the Watres Manufacturing Company, 1133-35 Broadway, New York City.

As shown it has an air passage provided with gauze screen to exclude dirt. At the outlet a throttle is provided, while in the center is located the gasoline inlet with adjusting needle and an adjustable air diaphragm with an outer ring spring mounted so that it may open freely to let out any explosions or back pressure from the engine, but which ordinarily remains



Sectional view of the "Duryea" Carbureter. A Metal float; B—Screened Inlet for Air C—Diaphragm which by raising lets in more air at the same time revolves guides D, raising friction in spiral slot K, thus automatically raising needle J and thus constantly proportioning the feed of gasoline to the increased air supply. D—Adjustable guides partially revolved by raising of diaphragm. E—Regulation for slow speed, F—Regulation for high speed G—Throttle H—Dash pots for steadying the [illegible] J—[illegible] Gasoline inlet. M—[illegible] carrying outer ring of diaphragm for relieving pressure from backfire.

closed and causes the major portion of the air to pass through (under its lower end) and intimately mix with the gasoline. This diaphragm is regulated by the suction of the engine, which withdraws the air from above the diaphragm, raising it and enlarging the air inlet.

The gasoline passage is extremely short, with level adjustable by the float needle, so that the gasoline can be drawn with very slight suction, which also contributes to full charges and large power. The float and its conical point act as one piece without pivots, levers or weights, but capable of a slight twisting motion, which twisting permits the point to grind itself upon its seat, and thus remain tight and clean. The gasoline inlet is protected by a gauzy cone, which catches any dirt from the pipes or tank, and which is removed readily for cleaning. The float chamber is closed at the bottom by a cap and is absolutely tight. The float needle is adjustable by unscrewing the needle stem with a small screwdriver. The gasoline-adjusting needle is adjusted by a differential screw on top of the carbureter, which is provided with a stem which may be carried to a point on the dash or elsewhere accessible by the operator while driving the vehicle. This enables the carbureter to be adjusted at any time in order to secure the best results. Ordinarily the screw is set to secure easy starting and certain running at very low speeds

This arrangement causes the needle to be partly revolved as the diaphragm rises or falls, thus varying its adjustment and the amount of this adjustment may be greater or less. This screw is adjusted for nominal or high speeds, as may be desired, and the adjustment is found by trial, by adjusting the differential screw to produce the desired result.

The float chamber is concentric with the liquid inlet, so that inclination in any direction will not cause more or less liquid to be admitted. The float has adjustments for very low speeds and also for normal or high speeds, and automatically adjusts itself between these speeds. This carbureter is manufactured in all pipe sizes and lists any size at $25.00

## "P. N. S." TIRE HOLDERS

The "P. N. S." Tire Holders manufactured by the Philadelphia Novelty Supply Co., 2033 N. 29th St., Philadelphia, Pa. are claimed to be excedingly strong and serviceable.

The tire holders are made with a swivel saddle plate which is free to conform to the radius of the tire. By the use of these holders the tires can be carried indefinitely without injury or deformity to either the side or back of the car. The tire holders are made in brass and finished either in polished brass or oxydized copper. Price of either style complete with straps, per set is $5.50.

## RADIATOR CAP ORNAMENTS

The Motor Car Equipment Co., 1727 Broadway, New York City, has recently added to its extensive stock of supplies a complete line of radiator cap ornaments. These ornaments include emblems of different orders, Masonic, Elk, Woodmen, Knights of Columbus, and others, as well as the familiar Gobbo, or "The God of Good Luck"

They are made up in different finishes: 24 Kt. gold finish, sterling silver and antique brass (polished).

The C. G. Folsom Mfg. Co., of South Bend, Ind make a specialty of well constructed automobile fenders. It has a well equipped plant for turning out high class work and expeditiously. This concern also makes hoods and tanks.

## A NEW AUTOMOBILE NOVELTY

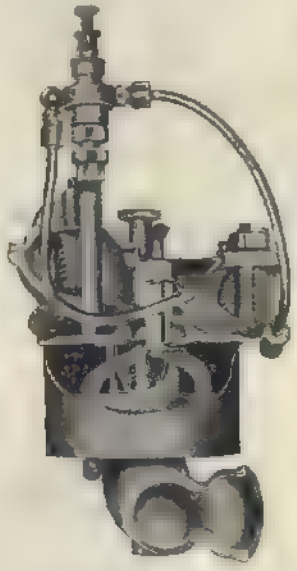
The Gloversville Purse Company, of Gloversville, N. Y. has recently placed on the market a purse which in design represents a leather cap worn by autoists.

The "Gloversville" Auto Cap Purse

While it is a novelty it is also a practical purse for bills and coin. It is made in a variety of leathers and colors. The top of the cap, which is perfectly flat, gives place for letters, name or whatever advertising matter may be desired, to be stamped in gold

## THE "G-L" GASOLINE ECONOMIZER

This device is being marketed by the "G-L" Economizer Company, Thoroughfare Building, 1717 Broadway, New York City. It is claimed that this economizer attached to the float chamber of any carburetor, eliminates the necessity of "tickling" the carburetor before starting and varies the



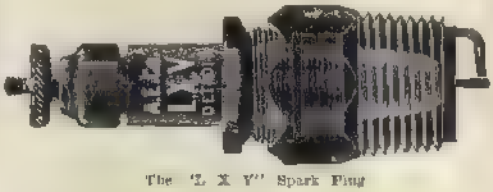
The "G-L" Gasoline Economizer

pressure of air on the gasoline in the chamber in the same ratio that the suction in the spray jet (due to the different engine speeds) varies. This affords a perfect mixture at all engine speeds, which consequently increases the power of the motor from 10 to 20 per cent. and saves all the way from 15 to 40 per cent. in fuel consumption. It keeps the engine from heating up, makes it more flexible and gives the car better hill climbing capabilities. In general, carburetors can only be adjusted for either high or low speeds, but not for both. It is claimed the Economizer remedies this fault by equalizing the air pressure on both sides of the throttle, thus sending a greater volume of the correct mixture into the engine at high speeds and a correspondingly lower volume of the mixture at slower speeds. The Economizer also enables the user to get this proper mixture readily, through just one adjustment, and when the correct proportion of air and gasoline vapor is once secured the adjustment can be locked in that position so that it will always be the same

This attachment is three inches in height, weighs four ounces, and sells for $5 00.

## THE "L X V" SPARK PLUG

The accompanying cut shows the "L X V" spark plug, manufactured by the Automobile Equipment Co., of Detroit, Mich. This plug is fully guaranteed for one year from the date it is put into service. One



The "L X V" Spark Plug

of the features of this plug is that it lists at the very low price of 65 cents. The porcelain cores are guaranteed against breakage and the electros used are of genuine meteor wire. The packing is by copper bound asbestos gasket beneath and two soft copper gaskets above the shoulder of porcelain.

The Falls Rubber Company, of Akron, Ohio, has recently been incorporated and capitalized with $75,000, for the purpose of manufacturing automobile and bicycle tires, mechanical and moulded goods and repair materials. This concern will operate the plant which at one time was operated by the Superior Rubber Manufacturing Company, Cuyahoga Falls, O. The officers are J. H. Weed, president; S. H. Sturgeon, vice-president; N. F. Seigrist, secretary and treasurer, and William Sherbondy, superintendent. The office is at Room No. 59, Central Office Building

The Gasket Supply Co., of Philadelphia, Pa., has recently purchased the Standard Gasket Company, Inc., also of Philadelphia, and with the new addition will be in a position to fill orders with great despatch, for corrugated, copper, steel, brass, rubber, asbestos, copper asbestos filled, etc., gaskets and anything in the packing line. They also manufacture washers of every description, punches and dies, do all kinds of metal work, stamping and forming.

## THE "GREYHOUND" FRONT SPRING FORK

The accompanying cut shows the front spring fork as used on the Greyhound motorcycle, built by the Greyhound Motor Works, of Buffalo, N. Y., and which conforms to the principles mentioned in our editorial on front forks in the September

The "Greyhound" Front Spring Fork

issue page 187. It will be seen that under the weight of the rider the position of the rocker bars at the front hub is such that when any obstacle is encountered by the front wheel the direction of shock is at a right angle to the rocker bars, so that the wheel instantly and easily swings upward and backward and the shock is absorbed by the heavy coil spring at the head. It should be noted that there is action at only two points in this fork—at the rocker bars, which play in ball bearings, and at the telescope tube containing the spring.

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**Harry Cunningham**, of Beaumont, Texas, recently established a record for continuous road riding, when he covered 560 miles in twenty-one and a half hours. He rode a Harley-Davidson, and averaged 26 miles an hour.

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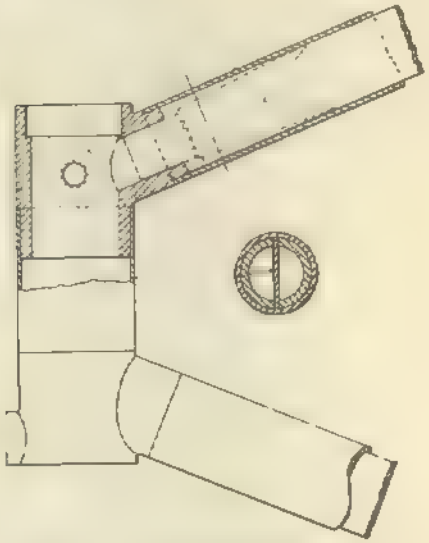
**The Reliance Motorcycle Co.**, of Oswego, N. Y., is building a large addition to its factory and expects to put its new car on the market in the spring of 1910. The car which this concern will bring out will be a 30-35 H. P both runabout and touring car listing at $1,250 to $1,500 respectively. Both the motorcycle and car business will be carried on under one head.

## THE "HEDSTROM" MOTORCYCLE FRAME

Carl O. Hedstrom, of the Hendee Mfg. Co., Springfield, Mass., has recently patented the motorcycle frame construction illustrated herewith. The object of the invention is to so construct such a frame, and especially the joint portion that connects the brace bars to the steering head and crank hanger that it will be extremely rigid.



Sectional views of the Hedstrom Motorcycle Frame

The gist of the invention consists in strengthening or reinforcing the frame by the use of a longitudinally arranged plate in the various tubes or brace members, which plate is brazed into supplemental stubs on short pieces of tubing that accurately fit the interior of the outer tubes, whereby when the whole structure is brazed together, these longitudinal ribs or plates serve to greatly strengthen the frame, both as to longitudinal and transverse strains.

The cut shows a sectional view of the steering head and the upper brace bar of the frame. This view clearly shows the manner in which the bracing web or plate is secured to the inner tubular stub.

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The Chicago Motorcycle Club recently moved from its old quarters at 267 Michigan avenue to 3259 Prairie avenue, where in its new seven-room club house it has fitted up a meeting room, committee room, pool, card and reading rooms.

**W. D. Hart**, of 205 Parkman street, Warren, Ohio, expects to locate in the bicycle, motorcycle and automobile selling and repair business. He would like to hear from manufacturers and is desirous of securing some good agencies.

# The Keystone "Six-Sixty"

The Munch-Allen Motor Car Company, with factory headquarters at DuBois, Pa., are placing a line of six-cylinder cars on the market, known as Keystone Sixes, that are claimed to be made of the highest grade of material obtainable and which are assembled and tested with the utmost care

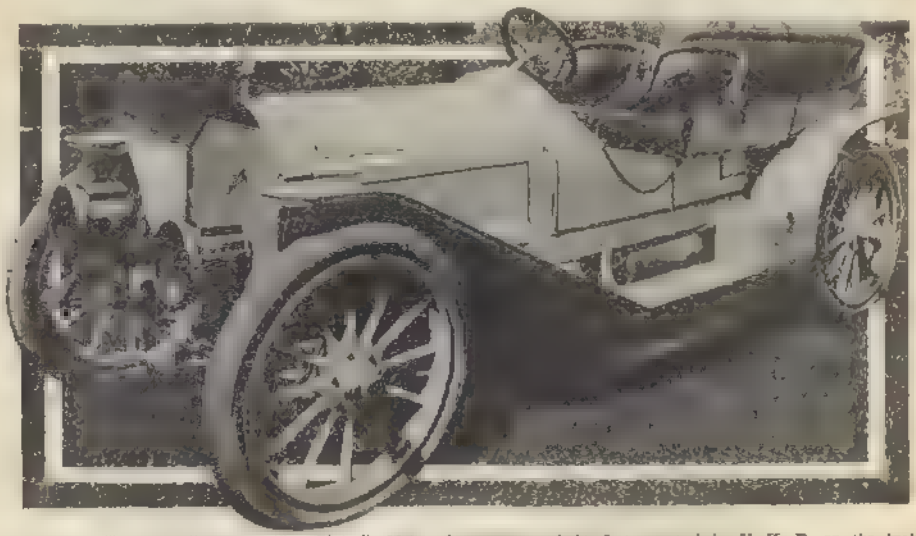

Fig. 1. The new Keystone "Six Sixty" Motor [illegible] by 5 water cooled. 61 H. P. on the brake at 1500 R. P. M. Dual ignition system [illegible] base 122 [illegible] cast, 56 inches, tires 36 by 4, double set of brakes on rear wheels, hot pressed steel [illegible] three speed and reverse sliding gear, shaft drive [illegible] $2250

The foremost in the line is a 60 H. P. car fitted with all up-to-date accessories such as Bosch high tension magneto, integral oiling system, multiple disc clutch, brake equalizers, etc. This car has a pressed nickel steel frame 163 in. long with a 4½-in. side member which is narrowed in front and fitted with a sub-frame to carry both motor and transmission. The frame is connected to the axles by means of four half-elliptic springs; the front ones being 36 in. long and the rear ones 50 in. long and all 2-in. wide. All spring eyes are bronze bushed.

The front axle is an I beam, made of one complete forging, with dropped center and spring pads, allowing a very low car and straight line drive. The rear axle is of the semi floating type running on long roller bearings with ball thrusts and fitted with four internal and external brakes, 14 in. in diameter with a 2-in. face and actuated through equalizers allowing an unequal adjustment of brakes without affecting the equality of pressure on either drum

### THE 6-CYLINDER MOTOR.

The motor is composed of six individual cylinders with valves on either side, which allow a very large valve, 2¾ in. in diameter, which gives a large range of speed It is claimed from 125 to 2000 R. P. M loaded have been obtained from this motor giving a car speed range of from 4 to 65 miles per hour; and some of the motors have accelerated as high as 2318 running light.

Fig. 2. View of the "Six Sixty" Keystone motor. Cylinders cast separately, valves on the opposite side, these valves being 2¾ inches diameter. Note the double system of exhaust pipes giving rapid egress of the exhaust gases. The bore [illegible] inches and the stroke 5 inches. Twelve plugs are used in connection with Bosch magneto and battery and coil. Fan is ball bearing.

The crank shaft is made of nickel steel 1⅞-in in diameter and runs on seven die cast bearings with positive lubrication to each bearing as well as each piston

Cooling is by water circulation through integral cylinder jackets with forced circulation by means of a large gear pump. This is aided by a large square tube radiator and ball bearing fan.

The drive is through an enclosed single joint and then by an enclosed pinion shaft to the bevel gears which are four pitch and 2 in. face. A bevel gear differential is used

CONTROL

Steering is by worm and complete gear with inclined post, fitted with an 18 in. aluminum webbed wheel on which are

Fig. 3. Keystone "Six Sixty" with [illegible] Note the [illegible] front seat giving the driver plenty of room. Wheel base 122 [illegible] Tires 36 [illegible]

A clutch of the multiple disc type is enclosed in drum bolted to fly wheel; and owing to the fact that this is oil tight and dust proof, it allows the 32 conodial discs to run in a continual bath of oil

Transmission is by sliding gear giving three speeds forward and reverse, the shafts and gears of which are made of chrome nickel steel and mounted on adjustable Timken roller bearings of ample size. This gear is fitted with a positive interlocking device that only allows gear change when the clutch is disengaged and also prevents clutch engagement when the gears are out of mesh.

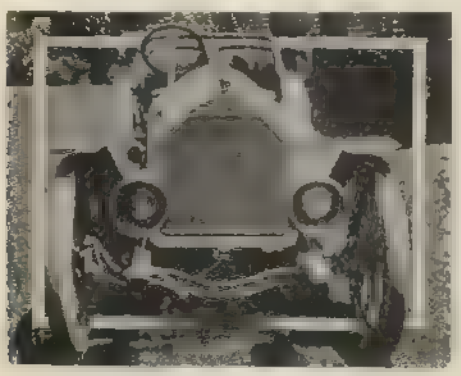

Fig. 4. Front view of the Keystone "Six Sixty" showing the [illegible] front axle and spindle

[illegible] the spark and throttle levers on a stationary quadrant. The service brake and clutch are actuated by pedals with adjustable pads, and emergency brakes and gear change by side levers. An accelerator pedal is fitted for use in traffic and rough roads.

The wheel base of these cars is 122 in and 36 x 4-in. quick detachable tires of any make are fitted.

The regular body equipment is a four or five-passenger baby tonneau with a back set [illegible] front seat, allowing the driver freer movement. A two or three-passenger roadster body can also be had.

All cars are fitted with double ignition systems with 12 spark plugs all on the inlet side of the motor to prevent fouling. The usual light, horn, tool and tire equipment is supplied, and the weight is 2,550 pounds. A liberal guarantee against defects in workmanship and material is given and the cars sell at $2,250 complete.

The company is also placing a light six-cylinder car of high grade material and workmanship on the market, which will have 34x3½-in. tires, 117 in. wheel base, magneto, disc clutch and selective gear set, which will be driven by a 35-40 H. P. motor and weigh but 1,900 pounds complete. The details and price of this car will appear in a later issue of this paper.

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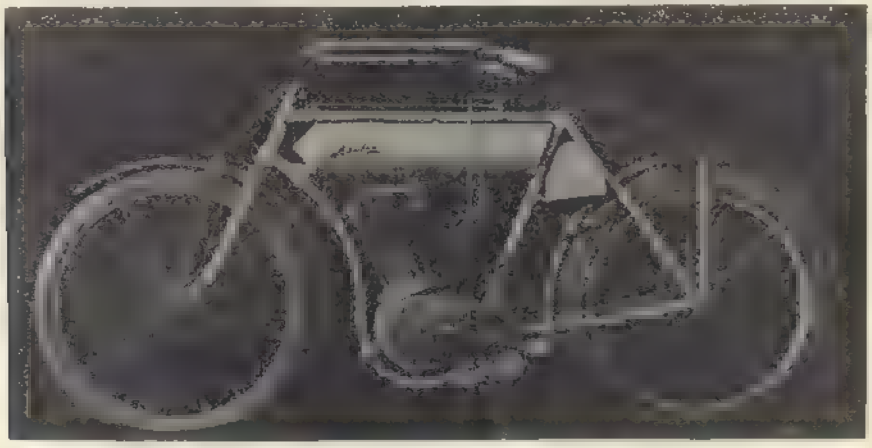
The American Sales Company, of Atlanta, Ga., will build a 4-cylinder $500 car for 1910

# The "Kiefler" Motorcycle

The Kiefler mortocycle which is built by the Kiefler Motor Works, 184-6 Broadway, Buffalo, N. Y., is made only in single cylinder type.

The motor is rated at 5 H. P. and is of the slow speed type. The cooling flanges are cut from the solid, making it possible to secure very thin and deep flanges. The intake valve is automatic and is mounted directly over the exhaust valve. All shafts loop type. Ignition is by two standard dry cells. The batteries and coil are incased in a metal case mounted in rear of seat post mast.

Drive is by chain belt. The tension is regulated by automatic idler, with pin on same to slacken tension on steep hills or on rough roads. Spark and throttle control is by friction levers. The ignition can be cut out from left grip and motor



The Kiefler 5 H. P. Single Cylinder Motorcycle two speed gear; drive by chain belt; wheel base 53 inches, 28 x 2½ inches tires, 1½ gal gasoline tank and 3 pt oil frame is of double loop type, price with direct drive $225 and with two-speed gear $260

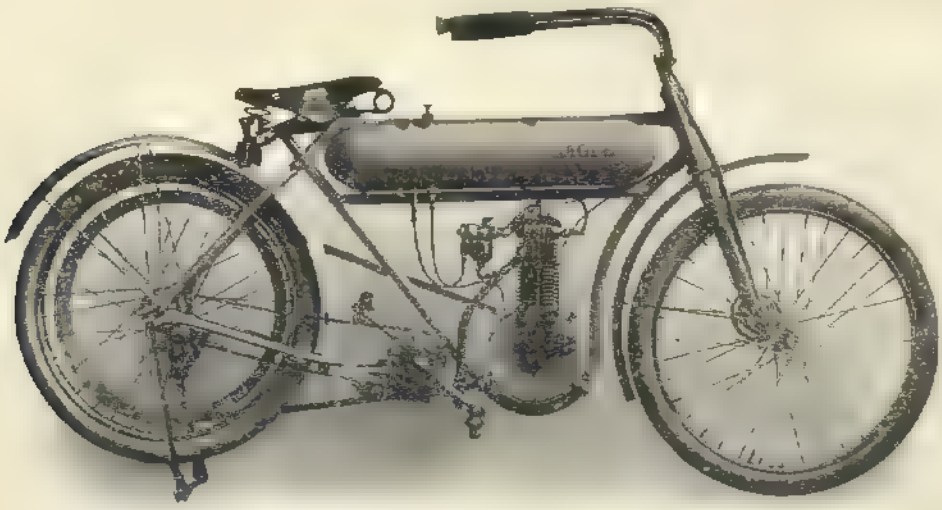
in the motor are 1 inch in diameter. The driving pulley is dished so as to bring driving belt directly over the center of the shaft bearing doing away with side friction. Lubrication is automatic through sight feed cup. The frame is of the double

Detailed view of the Kiefler Motorcycle motor; showing two-speed gear.

compression used for slackening speed. The rear hub is plain with steel brake disc on which is mounted contracting brake band 4¾ in. dia., 1 in. wide, lined with bronze giving metal to metal friction surfaces. This brake is operated by foot lever, which is mounted on a tubular foot rest across lower front stays, as there are no pedals. The saddle is mounted on an auxiliary rear stay which gives low riding position.

Gasoline and oil are carried in a double compartment torpedo tank which is mounted between the truss tubes. The tank holds 1½ gallons gasoline and 3 pints oil. The wheel base is 53 ins., 28x2½ in. tires are fitted. The two speed gear gives a ratio of 4 to 1 on high speed and 9 to 1 on low. The low speed revolves on 76 ¼ in. balls, while on high speed the whole attachment revolves as one piece; when lever is put in nutral engine is free. Motor can be started with crank. Both clutches on gear are of the circular contracting band type, which does away with side thrust on bearings. The low speed is adjustable with a cone like a hub. All wearing parts are hardened and ground. The clutch is operated by a lever on top of the gasoline tank.

This machine lists at $225 with direct drive and at $260 with two-speed gear.



The "Eagle" 3 H. P. Motorcycle. Model A; bore 3 ins. stroke 3½ ins.; 56-inch wheel base; 28x2½ inch tires; finish French Gray; price $185.00.

## THE "EAGLE" MOTORCYCLE

The Eagle motorcycle illustrated herewith is manufactured by the Eagle Motor Works, 1111 E. Franklin avenue, Minneapolis, Minn.

The cylinder is cast from the best grade of grey iron and is provided with large flanges to give ample cooling surface. The bore is 3 inches and the stroke 3½ inches. The intake and exhaust valves are 1½ inches in diameter. The spark plug is set in the side of the valve chamber. The fly wheels are 8½ inches in diameter and the main shaft runs in long phosphor bronze bearings. The connecting rod is a drop forging. The crank case is of aluminum and is held together with 9 bolts. The piston is fitted with two rings, which are accurately fitted.

The timer is operated by means of a Bowden wire running from the right hand grip, while the left hand grip operates the throttle by means of a Bowden wire. The Schebler automatic carburetor is used.

The front fork is of new design. As will be seen from the illustration, it has two springs one on each side held by means of bolt studs and arms securely clamped with a ⅜ inch axle through front hub

The frame is made of 1⅛ inch tubing. The head is of 10 gauge tubing while the engine is 16 gauge and the rest 18 gauge. The wheel base is 56 inches and the wheels are 28 inches in diameter fitted with 2½ inch, Kokomo or G & J tires. The Corbin coaster brake is used. Either a rubber or leather ⅞ inch V-belt is fitted. The gasoline tank holds 7 quarts, and the lubricating compartment 1½ quarts of oil. The gasoline tank is also fitted with a compartment which contains the batteries and spark coil. The finish is in French gray The price of Model A is $185. This concern also builds a 4 H. P. machine, called their Model C which lists at $210.

## THE 1910 GREYHOUND

The 1910 Greyhound shows a radical departure from all previous models manufactured by the Greyhound Works, 1443 Niagara street, Buffalo, N. Y. It will be seen from the cut that the motor is mounted vertically, and the fly wheel is much larger than heretofore. The cylinder has 3¼ inch bore and 3⅝ inch stroke which makes a piston displacement of a fraction less than 30.5. A well shaped combination tank is used carrying gasoline, batteries, coil and oil, and a spacious tool box is provided in the lower triangle of the frame. The control is of the double grip type, the connections leading through the handle bar and frame head. The well known Greyhound shock absorber is retained and is supplemented with a new cushion front fork. An exceptionally fine oiling device is claimed for the 1910 model, the oil route being carefully and scientifically figured out. The standard finish of the Greyhound is gray enamel in consonance with the name, blue striping being used for relief. The machine is fitted with a stand, 2½ inch tires, rubber pedals and full equipment of necessary tools.

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• **The Motorcyclists' Protective Association** has been formed in Los Angeles, Cal., to protect its members from theft and to check the passage of the severe ordinances recently introduced due to the growth of public prejudice.

## LOCOMOBILE USED IN ADIRONDACKS

It is well known that there are few roads in the Adirondack region through which automobiles can pass with any degree of certainty, and when the proposition of starting a motor stage line through the bad mountain roads of a section of the country between Forestport and Lake Fort Henderson, a distance of 23 miles, many people acquainted with the situation thought the proposition impracticable and well nigh impossible. However, members of the Adirondack League, an organization which has three club houses on a chain of lakes, decided to make an experiment in hopes of providing a means of transportation for members from the railroad station at Forestport to the Lake, and two Locomobiles were purchased for the purpose.

These cars from the very start negotiate the deep sand and almost impossible rough roads and do the trip on schedule time. The cars now cover the distance in two hours without difficulty, as they have been doing in the past.

The larger of the pair is a 35 H. P. Locomobile chassis fitted with a 12-passenger body, while its team-mate is a regular 7-passenger touring car. These are now being driven by the League's regular guides, who have been taught to handle them in an expert manner. Although the general run of the road is covered with sand six to eight inches deep, both of the machines pull equally well, and it is not necessary for passengers in the big car to "get out and push" at any stage of the game. This car has removable rear seats for baggage, a goodly load of which can be readily carried

The members who make use of this line are delighted with the enterprise, for it means that they now can get about from one lodge to another within a couple of hours, whereas it formerly meant a long, tiresome, inconvenient, half-day ride by horseback or a strenuous paddle in a canoe.

[illegible] H. P. Locomobile chassis fitted with 12 passenger body running as a stage coach between Forestport and Fort Henderson, N. Y., through the Adirondack

4-Wheel Drive Gas-Electric

(Something New)

Send for Catalogue. Agents Wanted.

COUPLE-GEAR FREIGHT-WHEEL CO.

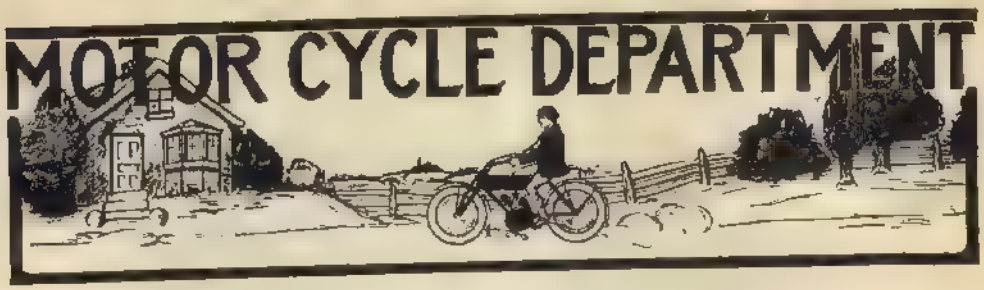
560 BUCHANAN ST., GRAND RAPIDS, MICH.

CRAMP

Parsons' Manganese Bronze Axles

Stronger than steel. Thousands in use. None have ever broken.

The Wm. Cramp & Sons Ship and Engine Building Company Philadelphia, Pa.




# EDITORIAL

## MOTOR CYCLE FRONT SPRING FORKS

Although motorcycle manufacturers are doing their utmost to bring the two wheeler to a state of perfection in regard to the road reliability of the machine and the comfort of the rider, still the latter subject in most cases has been given too little attention. One feature in particular which shows the lack of attention to not only the rider's comfort, but even his safety, is the method usually employed in constructing the front forks and in mounting the front wheel.

Many times motorcycles are built and tried out in localities where the roads are exceptionally good, and in such cases the need of a good spring fork or shock absorbing device is not felt; but, take the same machines and run them on bad roads, and the result is that both the machine and the rider suffers. The motorcycle with a long wheel base will naturally not jar the rider as much as the machine with a short wheel base, and the location of the motor also plays an important part in the ability of the cycle to withstand the bumps and jars. Some front forks are built to protect the machine itself from damage, but do not have resiliency enough to appreciably protect the rider.

Quite a few machines are fitted with front forks of the well known double arm type. This style, if properly constructed, furnishes an ideal method of relieving road shocks. The majority of these forks, however, are improperly constructed at their lower extremities; in other words, where the short arm connects the two forks This arm, of which there are two, one on each side of the fork, as a rule is inclined at an angle of 30 degrees below the horizontal, while it should, in our estimation, be inclined about 10 or 15 degrees above the horizontal line, thus giving the springs a chance to work the instant the front wheel hits a depression or stone, as the case may be. When the short arm is pitched at an angle below the horizontal line the motion of the arm to the horizontal position shoves the wheel against the obstruction instead of allowing it to swing upward and backward away from the obstruction. The most serious defect is, however, the fact that the resultant of the forces acting on the wheel is nearly in line with the arm, thus the component of the force delivered to the fork and transmitted to the frame and rider is sometimes even larger than that absorbed by the springs. The correct position of the arm carrying the wheel when the wheel center is in front of the forks, is horizontal when under load, so that all of its motion is above the horizontal position.

Some forks seem to be designed for looks rather than strength or with any regard to the direction or magnitude of the forces acting. It is much better to build the forks large and strong, even though they have a tendency to look clumsy, than jeopardize the life of the rider for the sake of artistic beauty.

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On September 2nd the Michigan State Fair Association will give a motorcycle race under the auspices of the Detroit Motorcycle Club.

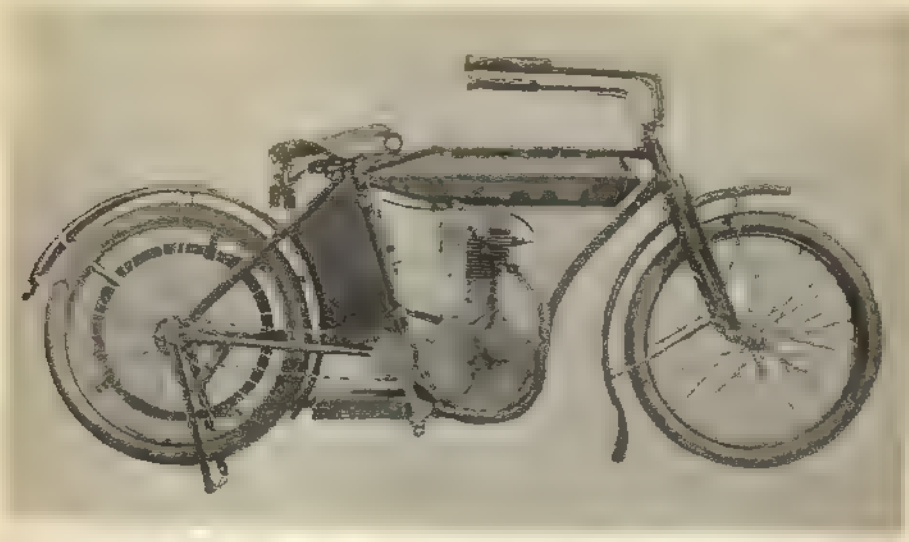
St. Paul, Minn., has purchased two machines for the police department, and should they prove successful it is very likely ten additional ones will be ordered, as the St. Paul police chief is very much interested in motorcycles

The New Era Gas Engine Company, of Dayton, Ohio, entered two New Era autocycles in the recent Eighth Annual Endurance and Reliability contest held at Cleveland, one of which received a clean score of one thousand points and one nine hundred and seventy-five points.

At the recent five-mile automobile races at Cross Point Track, Detroit, Mich., Mr. Don Klark, on a 7 H. P., N. S. U., made five miles in 5 minutes and 45 seconds. The N. S. U. Company also informs us that Mr. F. C. Wood, of London, who recently purchased an N. S. U. motorcycle, completed the A. C. U. Reliability Trials, traveling a distance of 1,024 miles during 6 days. The trials were under exceptionally bad conditions as rain fell almost continually. The performance of the machine attracted considerable attention, especially in regard to the performance of its two speed gear.

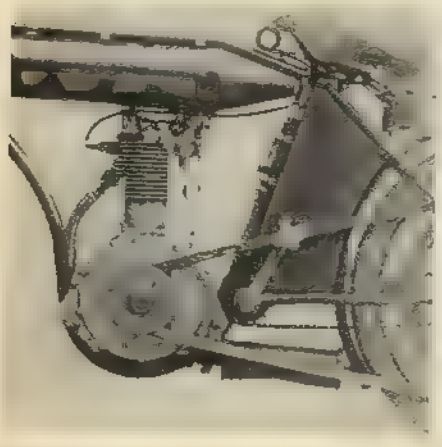
# The "C. V. S." 1910 Motorcycle.

The C. V. S. motorcycle, illustrated herewith, is manufactured by the C. V. Stahl Motor Works, 2845 Diamond street, Philadelphia, Pa. Particular attention is called to the simplicity of design of this machine, low frame and easy riding qualities. Both belt and chain drive models are built.



The "C. V. S." Motorcycle, 4 H. P. Belt or chain drive, roller timer, battery jump spark by motor set in loop frame torpedo shaped gasoline and oil tank Haltger carburetor; 26 inch wheels; 2¼ Peter Union or Goodrich clincher tire, double spring front fork, Eclipse coaster brake; Knock Out front axles Price $200

The motor is 4 H. P. and has a 3¼ in. bore by 3⅝ in. stroke. Extra large flanges are provided to give ample cooling surface. The head of the motor and valve chamber are cast in one piece of the best grey iron. The valve is 1¾ in. in diameter and has a 3-16 in. lift. The spark plug is set in the side of the valve chamber. A priming cock is fitted in the head of the cylinder. The fly wheel is 9 in. in diameter and runs in roller bearings. The crank case is made of aluminum and is held together by nine bolts, and the lower part of the cylinder is finished off with a square base and is bolted to the crank case by means of four bolts and nuts. The connecting rod is a drop forging of approved design and of ample size. The shaft and crank pin are fastened to the fly wheel in a very substantial manner and are claimed not to come loose. The intake and exhaust valve springs are held in place by a collar and pin and can be removed without tools. The crank shaft is 15-16 in. diameter and 3 in. long.



Pulley side view of the "C. V. S." Motorcycle The transmission is by a 28 degree V or leather belt A chain driven model is also made

The piston is fitted with three rings and six oil grooves. The piston pin is ½ in. in diameter and is held in place by means of two screws which pass through the top of the piston head. The main bearing of the motor runs in ball bearings and is 6¾ in. long over all. The gear case is cast integral with the crank case and is covered by a bronze plate. Special attention is called to the construction of the timer for 1910. This timer is of the roller contact type, which is claimed to entirely eliminate all tension on the timer spring. The detail view of the timer side of the machine shows the timer with cover removed, the latter being made of aluminum.

The photo shows the timer being operated by means of rod control, although for 1910 a flexible wire control will be featured both for the gas as well as spark. The

## A FLAME SHOOTING PLUG

The National Steel Products Company, 500 Superior Bldg., Cleveland, Ohio, have purchased the patents and manufacturing rights of the spark plugs and ignition goods formerly made by the Cleveland Spark Plug Company and will manufacture them in their plant at Lorain, O., in connection with their line of gas engines, storage batteries, magnetos, etc.

Spiral Core Cleveland Flame Shooting Spark Plug.

They make five distinct designs of plugs, a plug for almost every difficult proposition a gas engine manufacturer will encounter. One plug designed to withstand intense heat, another for high compression racing cars, etc. The most popular and best known of their plugs is the famous flame shooting "Spiral Core Cleveland" Plug. This plug is designed to give power from the charge of gas and at the same time eliminate the annoyance of continually cleaning. A combustion chamber is formed of the plug shell and the spark takes place inside the chamber, thereby getting a pre-explosion inside the plug and shooting its contents of ignited gas into the cylinder. The spiral core acts as a condenser of the charge, similar to the rifle of a gun barrel. The constant firing of the charge across the sparking points is supposed to shoot them clean at each explosion. The spiral core gives a whirling motion to the new charge as it is compressed, and throws any carbon or foreign matter to the outer edge of the inner shell then shoots it out at the next explosion. This plug sells for $2. The National Steel Products Company are prepared to manufacture these goods in a much larger way than heretofore.

## DIE CAST AUTOMOBILE BEARINGS

The Doehler Die-Casting Co., of 187 W. 9th street, Brooklyn, N. Y., has recently entered the "die-cast bearing" field and is now making a specialty of this line, having invented a new process for this purpose. By this process this concern claims to overcome two great obstacles so far the greatest handicap in this line. Each "die-cast bearing" is guaranteed to be absolutely solid and that the grain is closer or more compressed than the grain in the ingot.

This company recently moved to its present address where it has increased its capacity threefold and will take care of all bearing business with a despatch that is quite essential in the automobile trade. This company also makes castings for all parts in the accessories line such as magnetos, speedometers, etc.

## "U. S." POCKET AUTO COMPASS

The United States Auto Compass Co., 411-13 Grand avenue, Milwaukee, Wis., has recently brought out a Pocket Automobile Compass and Sportsman's path finder. The

The "U. S." Pocket Auto Compass

case is made of solid brass fitted with an aluminum dial, with large agate cap and heavy steel pivot. It can be read by night as well as by day and gives all points of compass as soon as taken from pocket.

## THE "J. A. W." SPARK PLUG CASE

The purpose of this device is to provide means to protect spark plugs when not in use, In other words, when the same are lying around loose in the tool box or locker. It frequently happens that when the extra spark plugs in the tool box or repair kit are brought out to replace others that have been broken or gone bad, the reserve plugs when installed are found to be cracked and unserviceable. To prevent this trouble is the object of this case, which is manufactured by A. P. Stillman, 124-26 Chambers street, New York. It is made of flexible gray rubber and fits over a plug in a manner that gives substantial protection to the porcelain, the rubber walls being very thick in the upper portion. It also keeps the plug clean and allows the same to be thrown in with the tools without any danger of the porcelain being broken. The list price of this case is 25 cents.

The "J. A. W." Spark Plug Case.

the privilege of engaging stenographic services at a cost not to exceed $10 per week each

The convention authorized the expenditure of $400 by the Membership Committee for the sole purpose of increasing the size of the Federation

The report of Treasurer Gibson was as follows: Receipts, $3839 07; expenditures, $3415 40; balance, $423.67, with $187.85 received from Secretary Wehman after the Treasurer's books had been balanced

The new officers elected for the current year are: President, Fred. Willis, Indianapolis; Eastern Vice President, C. C. Wilbur, Keene, N. H.; Western Vice-President, Charles Wyatt, Indianapolis, Southern Vice-President E. M. Hughes, Louisville; Pacific Vice-President, C. M. Frink, Los Angeles; Secretary, Le Roy Cook, New York; Treasurer, Dr. G. B. Gibson, Westboro, Mass

## NEW HUPP FACTORY

The Hupp Motor Car Company, of Detroit, which has entered the field this year with a new small car, the Hupmobile, is just finishing the removal of its equipment and the installment of new machinery in its new factory at Concord street and Jefferson avenue, Detroit. The location is considered ideal because of its splendid shipping facilities by rail and boat.

All the work will be done on the same level, and the building, except the part of it facing Jefferson avenue and where the office will be housed, will be one story high. It is built in the shape of a huge capital U, each of the wings being 350 feet long and 50 feet wide, with the connecting portion 131 feet long and 60 feet wide. The capacity of the new factory will be 25 complete cars a day.

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A. O. Smith Co., Milwaukee, Wis., is building an automobile factory at 27th and Keefe avenue. The building will be 800x285 feet, one story high, of reinforced concrete, with a power plant 40x60 feet and an office building 125x50 feet.

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The Dayton Rubber Mfg. Co., of Dayton, Ohio, has established its own branch in New York City, at 1595 Broadway, for the sale of its Dayton Airless Tires, under the management of Mr. Arthur L. Manley.

## OAKLAND ADDITIONS

The Oakland Motor Car Company has purchased a large piece of ground and a factory adjoining their present plant at Pontiac, Mich. The new buildings, together with the Pontiac Buggy Company property, will increase the area of the Oakland property to 12 acres, and the floor space of the plant to 700,000 square feet. Among the new buildings to be erected will be a four story structure, 72x140 feet, which will join the main Oakland plant and will be L-shaped. There will also be a one story building built for assembling purposes, 60x200 feet. An extension will be built on the test house to be 60x75 feet and two stories in height. Another building, 80x160, four stories, will be built, which will be used for the assembly of the new Oakland models.

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## AJAX-GRIEB COMPANY CHANGES QUARTERS

Owing to increase of business, the Ajax-Grieb Rubber Company has moved its executive offices from 57th street and Broadway to a large suite of rooms on the second floor of the Thoroughfare Building, 58th and Broadway. The old headquarters will be acquired by the New York selling force.

A new three story building is also being added to the Trenton factory. The building is 90x60 feet, and the first floor has been completed. R. S. Ireland, formerly eastern sales manager of the company, has been made sales manager.

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## RECENT INCORPORATIONS

Camden, N. J., Autocar Service Company, of New Jersey, to manufacture, operate, etc. automobiles or other self-propelled vehicles capital, $10 000

Indianapolis, Ind., Parry Auto Co., capital $1,000,000.

Memphis, Tenn., Corbitt Taxicab Company capital, $180 000.

Middletown, O., Imperial Automobile Co; capital, $500,000

Milwaukee, Wis., Ogden Farwell Garage capital, $10 000

Mt. Vernon N. Y., Westchester Automobile Co., to conduct garage; capital, $5,000

New York, N. Y., Hudson Motor Co., of America; capital, $12 000

Portland, Me., Eastern Motor Car Company; capital, $500,000

Portland, Ore., Deschutes Automobile Company, capital, $5,000

San Antonio, Cal., Piper-Lowry Auto Company; capital, $15,000.

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Manager James Joyce, of the automobile department of the American Locomotive Company, announces the appointment of R. B. Van Dyke as manager of sales. Mr. Van Dyke has been with the Locomotive Company for a number of years, and with the automobile department since its inception. He will make his headquarters at the New York offices and salesrooms, 1886 Broadway.

# Now Ready—The 1910 WINTON SIX

## exhausts the present possibilities of motor car perfection

The best car in the world has been made still better.

Radical improvements were impossible, but many refinements greatly increase the car's value to the purchaser.

The motor remains absolutely unchanged—Six cylinders, 48-horse-power. Ample evidence of the superiority of the six principle and of the Winton Six motor.

The multiple disc clutch is fifty per cent larger in diameter, and, with four springs, requires but slight foot pressure in operation.

The buyer now gets four forward selective speeds—a new extreme speed having been added. The previous top speed wasn't high enough for the superb Winton Six motor.

A newly-perfected carburetor emphasizes the motor's beautiful operation.

The frame is inswept in front to give a shorter turning radius.

Springs of increased size are semi-elliptical all round, permitting low suspension of body. Four shock absorbers and four rubber bumpers.

The front axle is of channel-section pressed steel.

Wheel base is 124 inches—an increase of four inches.

The body is longer and wider—a beautiful, roomy creation, with bucket seats forward and wide tonneau doors. Seven passenger equipment extra.

Running boards and guards are wider. Rear guards drop over the wheels.

Running boards and front floor are covered with pressed aluminum.

Other new features are: New design radiator, with longer tubes, longer filler, and hard-rubber cap; hard-rubber steering wheel rim, longer spark and throttle levers on steering column, brake and gear change levers are nearer the seat, increased brake leverage, solid brake spiders, long or short pedals at purchaser's option, carburetor primer on dash, improved design auxiliary gasoline tank on dash, Eisemann dual ignition, larger oil tank, oil cups on springs, larger exhaust tube, larger front universal joint.

As before, the Winton Self-Starter ***starts the motor from the seat without cranking.*** An attachment inflates tires without the use of pump. These are exclusive Winton Six features, not to be found on any other car.

The price remains unchanged at $3000. At this figure the 48 horse-power Winton Six represents the absolute limit of motor car value.

Specifications of the 60 horse-power Winton Six will appear later.

The coupon will bring you our interesting and factful literature. Mail it now.

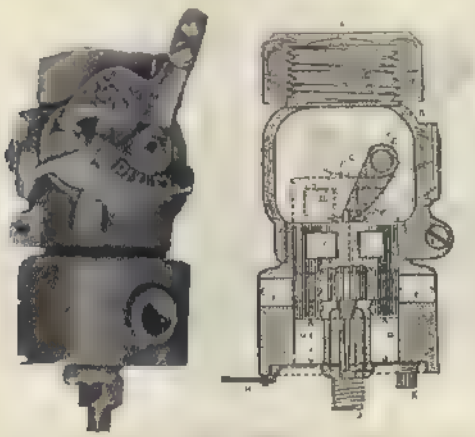
**THE WINTON MOTOR CARRIAGE CO., Member A. L. A. M., CLEVELAND, U. S. A.**

Winton Branch Houses (owned and operated by the company) in New York, Boston, Philadelphia, Baltimore, Pittsburg, Detroit, Chicago, Minneapolis, Seattle, and San Francisco.

THE WINTON MOTOR CARRIAGE CO., 417 Berea Road, Cleveland, Ohio. Please send Winton Six literature to

## "PIXLEY FLOATLESS" CARBURETOR

The "Pixley Floatless" carburetor, shown in the accompanying illustrations, is manufactured by George H. Pixley, 30 Huntington avenue, Boston, Mass. This device is small, and having no float, is specially desirable for marine work. It is so constructed that all parts are interchangeable and its operation is very simple. The gasoline is taken into the cylinders by means of suction and only the required amount is taken in. The gasoline is mixed with air by means of two air ports on each side of the water jacket, and these are regulated by the disc inside that is held closed by the throttle. The more the throttle is opened the higher the disc rises, thus opening the air ports until the disc gets as high as it will go. The tapered needle is raised by the disc allowing more gasoline to pass through thus making the mixture stronger. To take care of back firing, which will happen under certain conditions, a safety valve has been arranged on the side of the mixing chamber which relieves and lets out all of the pressure, thus saving any damage to the carburetor. This carburetor lists at $16.00 for the ⅜ in. size, $18.00 for the 1 in., $20.00 for the 1¼ in., and $22.00 for the 1½ in.



Two views of the Pixley "floatless" carburetor. The half tone on the left shows the general appearance of this device while the cut on the right is a sectional view

## STAMPED ALUMINUM FLOOR COVERING

The Factory Sales Corporation, 1438 Michigan avenue, Chicago, have just brought out a new floor covering for automobiles.

It is stamped from a special alloy of sheet aluminum in pyramid form, and, after stamping, is sand-blasted to give it all the appearance of the cast aluminum floors found on some of the most finely finished cars. It is designed to lay over the regular floor boards, securing it in place by the use of a special binding strip provided for the purpose. It is furnished in sheets 36 inches wide by 85 inches in length, and, being finished clear to the edges, there is no waste.

## THE "ARCO" CHAUFFEUR SEAT

The Arco chauffeur seat is manufactured by the Auto Rebuilding Company, 1307 Wabash avenue, Chicago, Ill

It is intended to be placed on the running board on the left side of the car.

It is made in such a way that it can be put on and taken off very readily. It is also collapsible and can be placed back in the tonneau by taking up very little room. The seat can also be used on the inside of the tonneau, back of front seat, therefore, used to accommodate one or more passengers in this apartment. The under post is hinged and fits into a brass socket with set screw. There are two braces on the side of seat, which are also attached to a socket that is bolted to the frame. There is a folding lazy back that folds down when not in use.

The "Arco" Chauffeur Seat

In size the seat is 17 inches wide, 15 inches deep and 10 inches high, and is made of metal reinforced with wood where necessary. The upholstery is in genuine leather with a roll on the top edge the cushion is stuffed with good hair bound in full with best leather and is very soft. This seat is also made as a single or double rumble, with or without base or tool box. The base is made to fit any car made, but stock sizes are for Ford, Maxwell, Reo, Brush, Buick and Cadillac. The price of the seat shown herewith is $50.00; single seat (for rumble) with lazy back, $25.00; double seat (for rumble) with lazy back, $48.00; single seat (without lazy back), $22.00, and double seat without lazy back, $42.00

## "DE SHAW" 2-CYCLE MOTORS

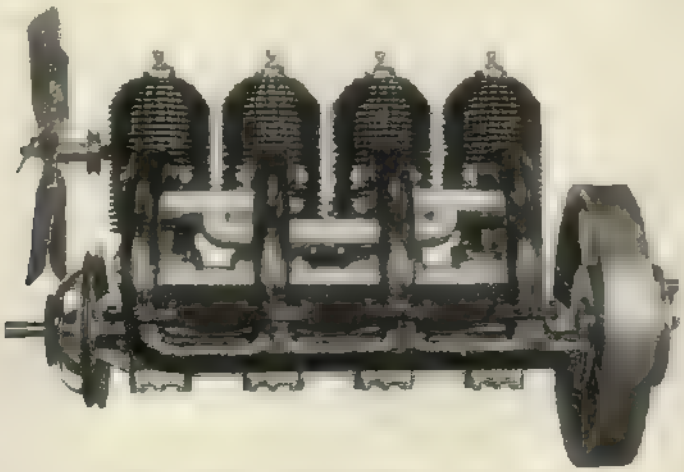
The De Shaw Motor Company, of 50-54 Summerfield street, Evergreen, L. I., N. Y., have developed a high powered air cooled, two-cycle gasoline motor of three and four cylinders respectively.

The cylinders are cast separate with flanges and head integral, and have a 3⅝ in. bore and a 3½ in. stroke. The cooling is afforded by a natural or direct circulation of air assisted by an aluminum fan placed in front of the motor, driven by a small pulley from the main shaft, while the fly wheel in the rear having fan shape spokes of special design exhausts the hot air, thus completing a most efficient system of keeping the motor cool. The crank case is composed of aluminum, strongly ribbed and so fashioned as to take the place of the ordinary pan under the motor, this case contains nothing but the carburetor on one side and the inlet pipe on the other side of the cylinders. The crank shaft runs on five long bearings

The pistons are of the ordinary type (with four eccentric rings) save a patented device in the top which is a hollow deflector. The connecting rods are constructed of Cramps' Special Bearing Bronze and fitted with adjustment screws to take up any slack which may occur after use. The bottom of the crank case is fitted with caps over each bearing which can be easily and quickly removed, thus disclosing the adjustment screws and permitting an inspection of the bearings.

The crank shaft is made of carbon steel, turned and ground, with very long bearings, lined with babbitt metal

The fly wheel is 17 in. in diameter and weighs 461 pounds. It is cast with 5 fan blades and includes an internal expanding oil clutch drum of special bronze and is expanded by a very simple and novel device. The ignition system is furnished by the Atwater Kent Unisparker and ordinary spark plugs, which plugs are fitted into bronze caps which also contain the priming cups. Lubrication is of the force feed type (Kinwood Oiler) with six leads, thus furnishing an abundance of oil to all the moving parts, this oiler being driven by a small pulley from the main shaft.



The "De Shaw" 2 cycle 4 cylinder air cooled motor

The weight of the motor complete does not exceed 250 pounds

## THE "PERFECTION" CLOCK.

The accompanying cut shows a new design "Perfection" auto clock, which is intended to be fastened to the dash of an auto, but is also so designed that it can be fastened to the handle bar of a motorcycle if so ordered. The leading features

The "Perfection" auto or motorcycle clock

of this new clock are: it is theft-proof and the works are set so the jar of the auto or motorcycle will not affect its keeping good time. The "Perfection" auto clock is made from solid brass, can be furnished in either brass or nickel finish and lists at $3.00. It is made by the Perfection Mfg. Co., Cleveland, O., and is sold direct from their works or by Smalley Daniels, 22 Motor Mart, Boston, Mass., who is their sales agent.

## THE "PLANHARD" CARBURETOR

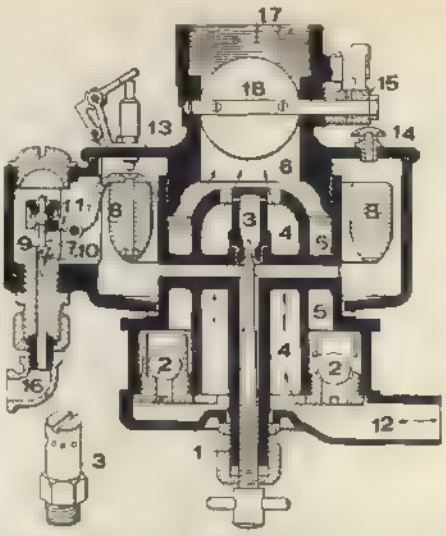
This carburetor, manufactured by the Planhard Carburetor Mfg. Co., Kokomo, Ind., is claimed to be a radical departure in carburetor construction.

In designing this carburetor Mr. Frank L. Kingston kept in view that simplicity of adjustment was one of the essential elements of good carburetor construction. All springs which are affected by weather conditions are done away with. It is single adjusting, having only a gasoline needle screw to adjust, and can be adjusted at any opening of the throttle, and will take care of itself from this adjustment automatic, controlling the high air by weight, using six bronze balls on bronze seats. The balls are all of the same size and weight, on different size openings

The suction of the motor causes a vacuum in the carburetor, thus allowing the atmospheric pressure to lift ball on large opening first, ball on next size opening will follow and so on until all are off of seat if the motor needs the opening, and if the motor requires only the opening of five, or less, only the required amount will lift to feed the motor, thus making the carburetor automatic. The balls have no steps; they lift to give the full area of opening, and then float as a ball does on a stream of water.

All of the air is taken around the spray nozzle, both high and low, doing away with the overshot air. The air at both high and low speeds is strangled thus breaking up the mixture and giving a more perfect gas from low to high, and doing away with the overshot unmixed air.

The spray nozzle acts as a priming cup and stands full of gasoline when motor is idle, thus giving a perfect charge of rich gas to start on, making it a very easy starter. The float is claimed to give more




Sectional view of the "Planhard" Carburetor; 1, needle valve; 2, bronze balls; 3, spray nozzle; 4, constant air opening; 5, high air opening; 6, strangle point for high air; 7, gasoline valve; 8, float; 9, cone shaped bronze valve; 10, knife-edge seat; 11, swinging ball joint; 12, warm air connection; 13, flasher; 14, vent; 15, ratchet lever; 16, gasoline connection; 17, [illegible] throttle.

than twice the pressure on valve seat than ordinarily used. A cone-shaped bronze valve is used on a knife-edge seat with a swinging ball joint. The seat is made oval so that all dirt will wash off. The feed level is the same at all times no matter if running up hill or down or on a sliding place. All air is taken through the center of the carburetor, thus allowing the piping of warm air to the carburetor for both high and low.

The feature of this carburetor that makes it especially desirable for marine use is its level feed. This feature together with the fact that an air connection can be piped away under the deck of the boat makes it impossible to get water or spray into this carburetor.

The Planhard Carburetor

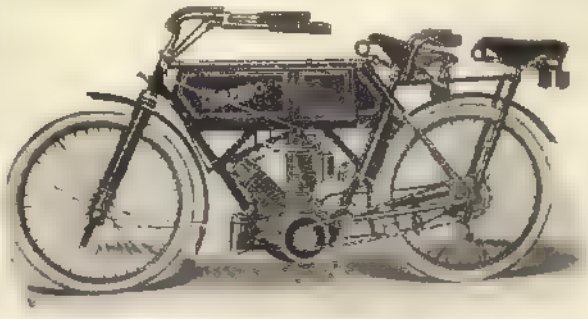
## THE "SCHWEPPE & WILT" STATIONARY NUT STEERING GEAR

The illustration shown herewith is a sectional view of the Schweppe & Wilt Stationary Nut Steering Gear, manufactured by the Schweppe & Wilt Gear Mfg Co., Champlain and Meldrum avenue Detroit, Mich

The principle of the stationary nut gear is very simple. The worm moves up and down and turns a rocker shaft arm to which is attached the ball arm and the movement can be described best as simply a push and a pull. At the same time this construction produces a gear which absolutely cannot lock under any condition. In addition all the working parts are immediately accessible by removing the three

## THE "TORPEDO" TANDEM ATTACHMENT

In the last issue of our Journal, on page 190, we published a description of the Torpedo Tandem Attachment manufactured by the Hornecker Motor Mfg. Co. of Genesee, Ill. We inadvertently, however,



The "Torpedo" Tandem Attachment. This cut shows a Torpedo motorcycle fitted with the "Torpedo" tandem attachment

showed a cut of their rear spring forks instead of the tandem attachment and are therefore taking this means of rectifying our mistake. The cut shown herewith illustrates the attachment as fitted to a Torpedo motorcycle.

The principle of this attachment is, that it is suspended on springs the same as the Hornecker front spring fork. This spring suspension entirely eliminates all jarring and thus allows both riders to ride comfortably. The attachment can be fitted to any motorcycle in about ten minutes. The price of this attachment, less saddle, is $15 00.

## "MESINGER" RE-BOUND CHECK SPRING SLIGHTLY CHANGED

The Mesinger Re-Bound Check Spring, manufactured by the H. & F. Mesinger Mfg. Company, 1801 07 First Avenue, New York City, and described in our May, 1909 issue, page 150, has slightly changed. The change is not in the construction of the spring part, but in the method of fastening the same to the frame of the car. The new clamp is U shaped and is fastened to the frame by one bolt.

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The prompt and united efforts on the part of the Baltimore Motorcycle Club will doubtless result in the modification of the proposed Good Roads Law for Maryland As originally drafted, the law provided for a tax of $4 per year, together with the carrying of a license tag—no size specified As it now reads, the bill to be presented to the next Legislature provides for a tax of only $1.80 per year and a license tag with figures not over one inch high and one-eighth of an inch in diameter. Fractional charges and proportionate rebates on licenses for less than one year are also provided for.

## THE "NEAL" TIRE CASING REPAIR PLUG

The repair plug here shown is designed specially for motorcycle tires. It closes the inside and outside of the puncture and prevents sand and water from working in, causing sand blisters and rotting of tires

The "Neal" Tire Casing Repair Plug.

This repair plug is manufactured by the F. M. Neal Co., 1048 East Main street, Bridgeport, Conn

## "HELMET" OIL PUT UP IN SMALL SIZE PACKAGE FOR MOTOR CYCLE USE

Charles H. Besly & Company, of 15-21 South Clinton street, Chicago, Ill., have recently placed on the market a popular size package of Helmet Oil for motorcyclists' use The cut is half size.

This cut shows half size view of package of Helmet Oil for motorcycle use.

This oil contains nothing but pure lubricating matter and is guaranteed not to become rancid. No acid or pitch enters into its composition, so no sediment is left to clog or gum bearings. The list price of the package shown is 25 cents.

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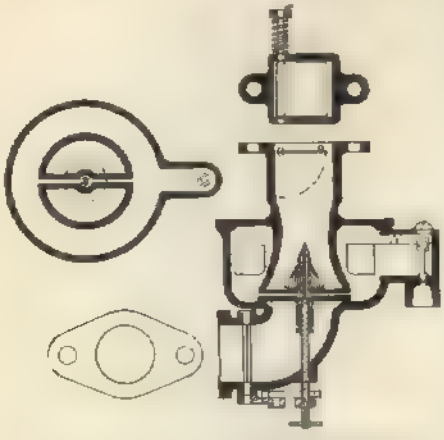
The Auto-Bi Company of Buffalo has been through a course of reorganization and general improvement of methods during the past eight months. One result was that shipments of 1909 Greyhounds commenced in December. Another is that now, with better business than ever before, Greyhounds are to be had for immediate shipment and so many annoying delays are avoided.

## THE "WACKENHUTH" CARBURETOR

The Wackenhuth Gas Engine & Carburetor Co., 26 Hackett Street, Newark, N. J., has just brought out the Wackenhuth carburetor, which is shown herewith in sectional views.

This carburetor is of the automatic float feed type. The fuel outlet, or nozzle, is from the point of a cone, which is clearly

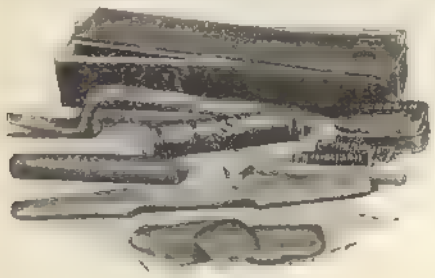



Sectional Views of the "Wackenhuth" Carburetor

shown in the illustration. The fuel spreads down the side of the cone, where it mixes with the air, thus forming a homogeneous mixture. The air inlet is from the square opening on top, in which is placed a square shutter with spring tension, for the auxiliary air supply. The square shutter is somewhat smaller than the square opening. This opening can be connected with a hot-air supply pipe if desired. The cone or needle valve and throttle are link connected, and open and close together

## THE "MICHELIN" TIRE REPAIR KIT

A very complete and compact tire repair kit, suitable for repairing all makes and types of automobile tires, is manufactured and sold by the Michelin Tire Company, Milltown, New Jersey. This outfit, illustrated herewith, includes one



"Michelin" Tire Repair Kit

elbow lever; one spur lever; one tube of talc; one roll of friction fabric; two tubes of Michelin patching cement in a metal box; four red rubber patches of different sizes with bevel edges; and one dummy valve, all put up in a substantial and well finished wooden box with sliding cover Several of the articles named are worthy of special mention, including the Michelin elbow and spur levers, which greatly reduce the labor involved in putting in place or removing clincher tires of all types These tools are strong, well finished and form a useful addition to any repair kit.

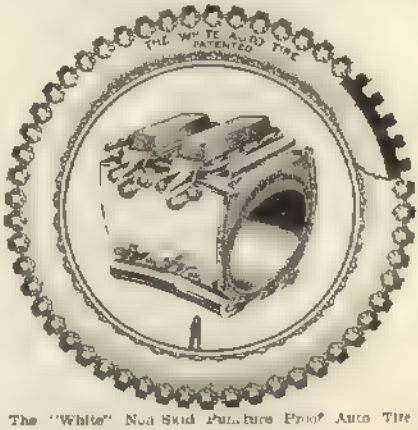
Michelin patching cement, two tubes of which are contained in this repair kit, is made of pure unadulterated dissolved Para rubber.

It may be purchased in larger quantities in both tubes and cans of various sizes for private use and for garages and repair stations.

## THE "WHITE" PUNCTURE-PROOF AUTO TIRE

One of the latest puncture-proof tires placed on the market is the "White," manufactured by the White Tire Co., Broadway and Seventy-second street, New York City.

This tire is claimed to be absolutely puncture-proof, non-skidding and to be entirely elastic. The tread of the tire consists of a series of rubber blocks which are made of the highest grade rubber, and are held




The "White" Non Skid Puncture Proof Auto Tire

in place by steel clamps. Due to the fact that the rubber blocks are separated from each other all chance for suction is entirely eliminated and there is always a circulation of air between the rubber blocks, thus preventing any possibility of overheating which frequently causes the destruction of the inner tube. The leather used for the sides is cowhide tanned and prepared by a special process and, it is claimed, will not stretch or break from strains or bruises

## THE AUTO SILLIKEN

Gus Balzer, of New York City, has just placed on the market the Auto Silliken, or The Idol of More Luck. It is a good luck emblem, designed specially for the radiator cap or dashboard of the auto. It retails for $1 50 in bronze plate and $3 50 in solid bronze.

diameter a center punch mark is sufficient. The points of the jaws are case-hardened and all parts are made of first quality cold rolled steel nickel-plated. The device is made by the Economic Tool Co., of Lorain, Ohio, and lists at $2

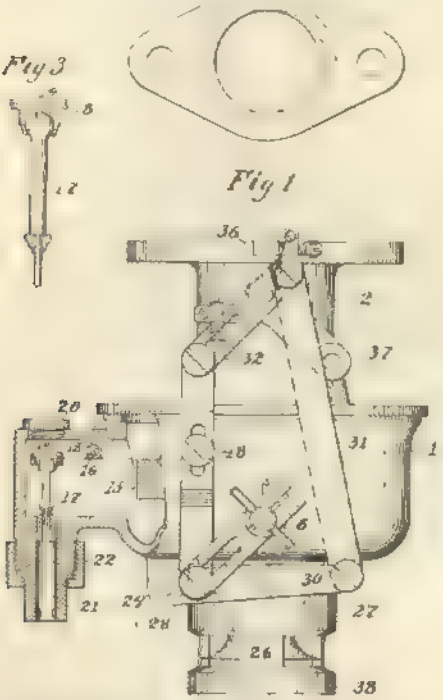
## THE WACKENHUTH NON-SPRAYING CARBURETOR.

The carburetor, illustrated herewith, is manufactured by the Wackenhuth Carburetor Co., 26 Hackett street, Newark, N. J. It was described and illustrated in the July issue of this journal, on page 122, but since that description was given we have secured better drawings and a more detailed description.

Fig 3



Fig 1

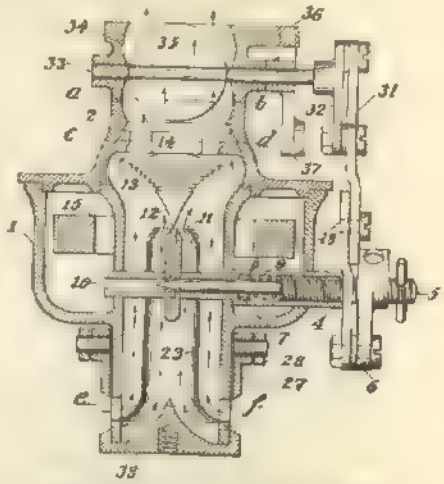


Wackenhuth non spraying carburetor showing the arrangement of the external parts.

The gasoline outlet or nozzle 11, is on the point of the cone 12, onto which it is spread by the passing air current, by which it is absorbed before it reaches the top of the cone. The mixture formed is uniform, on account of the cone spreading the gasoline into a thin film of large surface, and the air in its passage by the cone is also spread to a larger diameter, and in so doing, causes the air to absorb the gasoline, and form a uniform mixture. The ratio of gasoline and air is maintained by connecting the throttle 35, needle valve 5, and air inlet port sleeve 27 in an adjustable lever link combination 28, 29, 30, 31, 32, 48 and 6, which gives a perfect mixture at all speeds and load of engine. The opening of throttle also opens the needle valve and air inlet ports.

The adjustment for correct mixture is made by running the engine at slow speed with a low throttle, and noting position of needle valve 5 for correct mixture, and

Fig 4.



Sectional view of the Wackenhuth carburetor

then running the engine at open throttle, maximum speed and power, and noting position of needle valve for correct mixture; then adjusting the lever link combination, so that the needle valve is at the correct position at high and low speeds with movement at throttle

The mixture of gasoline and air depends on the absorption power of air for gasoline at a given temperature; it does not depend on any spraying process.

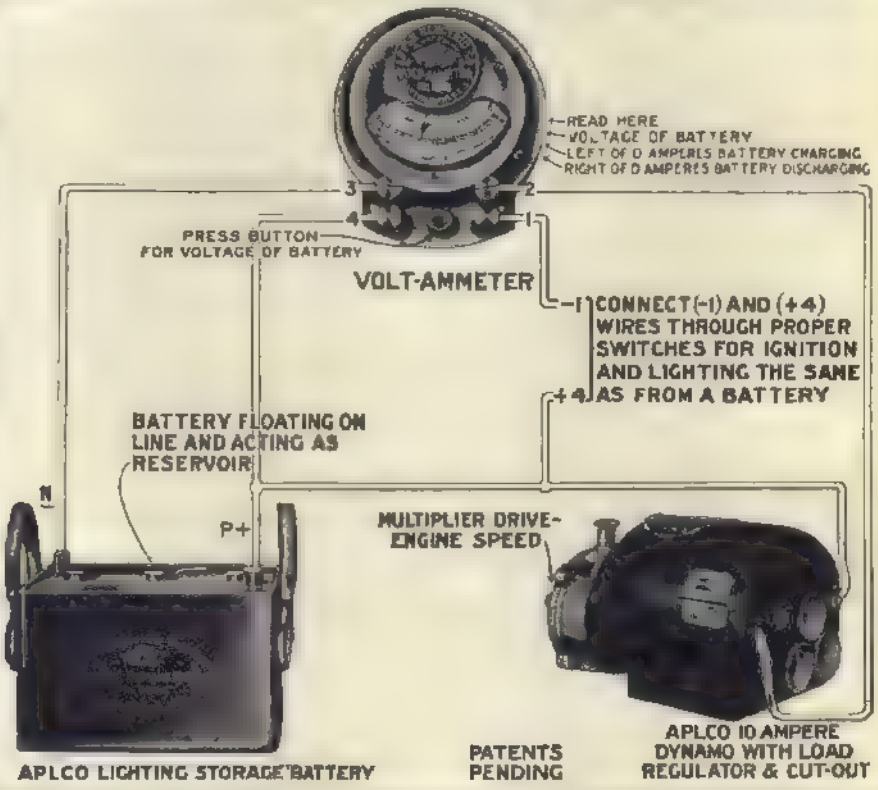
It is claimed this carburetor prevents backfiring, due to poor mixture, in the crankcase of two-cycle engines. On two port two-cycle engines a check valve is required between the carburetor and crank case inlet. The price for the 1¼-inch pipe size is $18.00.

## THE WOODWORTH TREADS FOR 1910

The Leather Tire Goods Co., Niagara Falls, N. Y., have just brought out a new style of tire for 1910 called the Woodworth Improved Self-Adjusting Tread

The method of holding this tread on the tire differs considerably from that of the well-known Woodworth Adjustable Tread. It consists of a number of galvanized steel plates riveted along each side of the tread a short distance apart, connected by short and very stiff springs. Each spring is

# An Automobile Improvement Which Makes It Safer, Simpler and More Economical




The latest and most novel use to which electricity has been put in the last year or two is for electric lighting in addition to lighting gasoline automobiles as is now accomplished by the "Apleo" Electric Lighting System for automobiles as has recently been perfected by V. G. Apple and his corps of engineers and mechanics

The "Apleo" System eliminates flame with its fuel of coal oil and acetylene entirely from the car.

The "Apleo" System saves the cost of coal oil, carbide and having batteries and gas tanks continually recharged in addition to the time saved.

The "Apleo" System replaces dry batteries vibrator coils troublesome timers magneto gas tank or acetylene generator coal oil, acetylene gas, carbide oil lamp fixtures gas lamp fixtures, matches, loss of time stopping car to light and regulate acetylene gas as with the electric system it is all done by switches from the seat at will.

Besides the greater convenience of an electric lighted auto, the light, which is whiter and stronger, will be projected farther than is now possible with the acetylene headlights now commonly in use. The electric lighting of automobiles, in addition to being more convenient, is much more economical, as it saves the total cost of oil, carbide or acetylene and the expense, trouble and annoyance of having batteries and gas tanks continually recharged.

Can be installed on any machine. Send for descriptive booklet Agents wanted in unoccupied territory.

**APPLE ELECTRIC COMPANY,** 20 N. CANAL STREET DAYTON, OHIO, U. S. A.

into a very stiff putty, while if it is desired to make it set quickly, one-quarter Brown Japan is mixed with the oil.

It sells in kegs or pails for 20 cents a pound and in barrels or casks for 18 cents.

The Non-Corrosive soldering fluid, as the name implies, neither rusts nor corrodes and is non-poisonous. It makes a clean, smooth, permanent job and keeps the soldering irons clean. It is put up in 1, 2, 3, 5, 10-gallon cans, half-barrels and barrels, and sells for $1.50 per gallon in small quantities.

## THE "VASCO" WINDSHIELD

This windshield is designed and marketed by the Victor Auto Supply Mfg. Co., 42 West 43rd street, New York, and manufactured in their own factory at Providence, R. I., and combines many new features with the essential points required in a perfect windshield.

It is constructed of the best heavy gauge, seamless brass tubing, piano finished mahogany and selected plate glass, with

The "Vasco" Windshield.

castings of superior grade, accurately milled and interchangeable and is sold at a reasonable price.

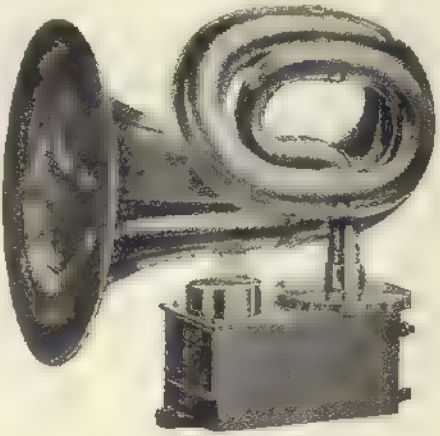
The use of friction discs instead of springs makes the operation of the shield easy with one hand under all conditions. All glass is protected, making breakage by jar absolutely impossible. If desired, the top half can be locked in a tilting position, absolutely rigid, by a short turn of the friction discs.

An important feature is the gap or means of opening the shield at the parting, permitting an unobstructed vision ahead in rain or fog and at the same time giving perfect protection from the elements. The shield folds inside the car, parting very low in the center, making a 14½ inch drop combined with an eccentric motion which allows clearance of the steering wheel on any car and gives an unobstructed vision with the shield closed.

## THE "ELECTRO-CORNO"

This is the title of an electrically operated automobile horn manufactured by the Electro Corno Co., 46 48 W. 28th street, New York. It is absolutely fool proof and is operated by simply pressing the button.

It is suitable for either large or small cars and may be blown without loosening the grip on the steering wheel. It may be connected direct with the ignition



The "Electro-Corno."

battery or magneto, as it may be used with either direct or alternating current, otherwise four dry cells or a six volt storage battery is most sufficient. The Electro-Corno is made entirely of polished brass, with a base of black enamel. All contacts are platinum pointed. A special push button is fitted to the steering wheel and is connected by a waterproof cord to the horn and batteries. An extra push button for the foot may be used if desired. This horn, completely equipped with wire, push button, etc., lists at $20.00.

## CASTINGS FOR AUTOMOBILE ENGINES

The Hall Gas Engine Mfg. Co., of Byesville, Ohio, are making automobile and marine engine castings in their new up-to-date foundry, which is especially fitted for this line of work. They are manufacturers of the Hall Opposed Engine, which adds considerable to their knowledge of what a casting ought to be to machined right, at the lowest cost

The foundry makes a specialty of this particular line of work and in the sizes used in automobile engines, the iron, sand, coke and other material, and the core ovens, cupola and entire foundry equipment, as well as the workmen, are selected to fit this work. The plant has been made still more complete by the installation of a brass foundry in addition to the iron foundry.

# A Suggestion to Garage Men!

Did it ever occur to you to take up the taxicab business as sort of a side line?

Many are doing so and making a handsome profit—even in small localities. Why not you?

Atlas TWO CYCLE MOTOR CARS

## Taxicabs are in use by 25 Companies

The Atlas 2-cycle, 2-cylinder engine has successfully solved the problem for power plant requirements, because the engine has but five moving parts, being practically indestructible.

The power is ample, with a remarkable speed variation—safe and easy control of both engine and transmission.

The Atlas taxicab is especially designed for maximum strength and durability. Completing a combination which has been universally recognized and quickly taken advantage of by taxicab companies in general.

**Send for Illustrated Catalog and 2-cycle Catechism**

## Atlas Motor Car Co.

**Members A.M.C.M.A.**

**92 Birnie Avenue**

**Springfield :: Mass.**

**Commercial Dept.,**
**1924 Broadway, New York**
**Fred. H. Adams, Manager**

**ATLAS 20 H. P. Taxicab, $2350**

Seats five passengers inside—turns in 28 foot space, pressed steel frame, 102 inch wheel base two speed sliding gear transmission geared pump, geared fan geared over A-water-Kent ignition—3 oil lamps, and complete tool outfit with jack and tire repair kit.

Atlas
TWO CYCLE MOTOR CARS

***Taxicabs are now in use by more than twenty-five companies through the United States.***

The leading companies in New York, Chicago, St. Louis and many smaller cities are now successfully operating Atlas cabs.

The simple Atlas two-cycle, two-cylinder engine with five moving, non-adjustable, indestructible parts has successfully solved the power problem.

The Taxicab requires an engine of peculiar construction, so simple that it is almost impossible for it to get out of order, economical in fuel consumption, flexible in control, and fool proof.

Other requirements are a maximum amount of body room with a minimum amount of mechanism and extreme durability.

Atlas Taxicabs combine all of these features in a greater degree than any other taxicab built.

Write us for further information regarding Atlas Taxicabs, and why the two-cycle engine is ideal for this type of car.

**With the catalog we will send a list of users.**

**ATLAS MOTOR CAR CO.**

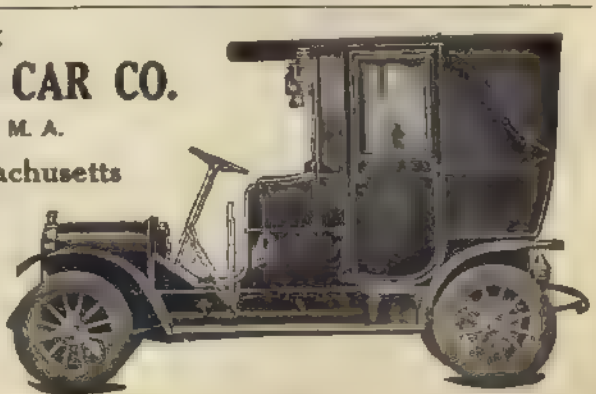
Members A. M. C. M. A.

**Springfield, Massachusetts**

New York Office:

**1924 Broadway**

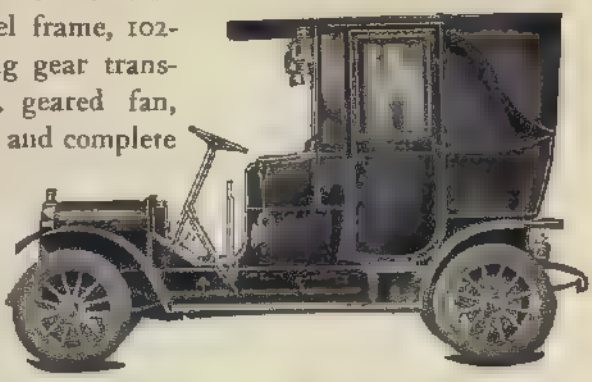
Fred H. Adams, Manager



# Atlas
TWO CYCLE MOTOR CARS

## 20 H. P. *Taxicab* $2350

Seats five passengers—turns in 28-foot space, pressed steel frame, 102-inch wheel base, sliding gear transmission, geared pump, geared fan, geared oiler, 3 oil lamps and complete tool outfit with jack and tire repair kit.



***Progressive Taxicab Companies Are Quick to Recognize the Superior Features of the Atlas***

Let us tell you the reason for the great popularity of Atlas Taxicabs.

It is because of the 2-cylinder, 2-cycle engine with only five moving parts -that is practically indestructible—which so successfully solves the problem for power plant requirements.

Then there are other great advantages the ample power, remarkable speed variation, the safe and easy control of both engine and transmission—the steering wheel and operating levers mounted on the left side—a decided improvement for safe running in crowded streets.

Garage men are quick to recognize these superior features—that's why they pin their faith to the Atlas.

**Send for Illustrated Catalog and 2-Cycle Catechism**

# ATLAS MOTOR CAR CO.

Members A. M. C. M. A., 92 Birnie Avenue, Springfield, Mass

**1924 Broadway, NEW YORK ∴ Fred H. Adams, Manager**

# The MAXIMUS Makes Motors Mote

Over 12,000 satisfied users. If you are not one of them, you should be; they save your temper, time and money.

PATENTED JUNE 2, 1908

**More Speed**

**More Power**

**Less Plug Trouble**

**Less Coil Trouble**

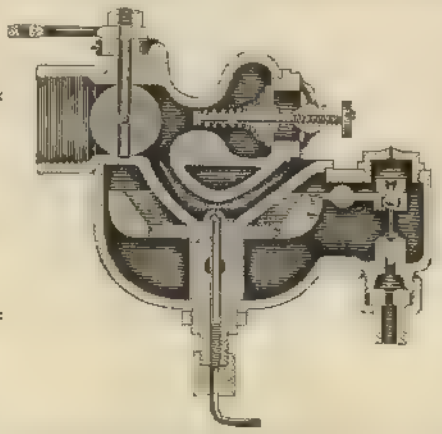
THE "MAXIMUS" TIMER

**We know** we have the best timer made, and that it will improve the speed power and smooth-running qualities of your motor; if it does not, your money will be refunded without argument. 85 per cent. of 1908 model machines are equipped with roller type timers. The Maximus is constructed on the principle of the best of these, but has several improved features that overcome the weak points of roller-type timers, and make the motor mote. A special Maximus, designed to be easily applied to 2-cylinder Buick and Models M and N Ford is now ready for delivery.

The unprecedented success of the Maximus Timer encouraged us to experiment in carburetion, and, after careful testing and improving, we are now ready to offer

## The MAXIMUS CARBURETOR

**Simplified Carburetion**



**List Price**

**1-inch Size, $11.00**

**1½-inch Size, $12.00**

The principal feature is the improved method of applying both the constant and compensating air. The small opening for the constant air creates a strong vacuum on the nozzle, resulting in throttling to very slow speed and ease in starting. The method of applying the compensating air does away with the sudden increased rush of air on the spray nozzle at change of throttle.

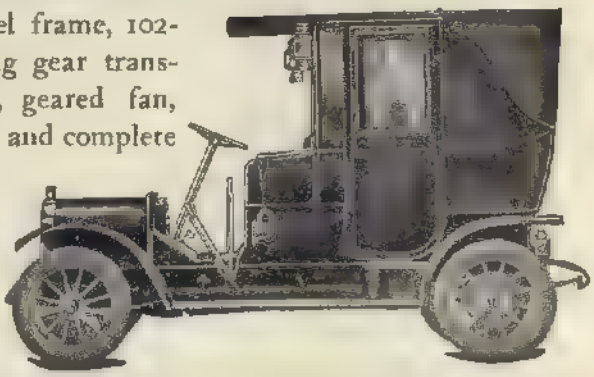
MADE BY

**The BECKLEY RALSTON CO., 80-82-84 Michigan Avenue, CHICAGO, ILL.**

# Atlas
TWO CYCLE MOTOR CARS

## 20 H. P. *Taxicab* $2350

Seats five passengers—turns in 28-foot space, pressed steel frame, 102-inch wheel base, sliding gear transmission, geared pump, geared fan, geared oiler, 3 oil lamps and complete tool outfit with jack and tire repair kit.



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**Send for Illustrated Catalog and 2-Cycle Catechism**

# ATLAS MOTOR CAR CO.

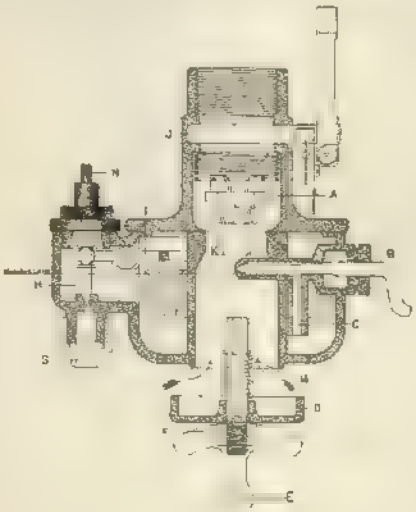
Members A. M. C. M. A., 92 Birnie Avenue, Springfield, Mass

**1924 Broadway, NEW YORK ∴ Fred H. Adams, Manager**

## PALMBLA CARBURETER 1910 MODEL "D"

In designing the 1910 Model Palmbla carbureter, the inventors efforts have been in the direction of simplicity in construction and operation as well as to produce an instrument to create and maintain a mixture constant as to proportions of gasoline and air and homogeneous at all motor speeds.

The principal feature of this carbureter lies in the flexible or double tube arrangement above the spray nozzle



Sectional view of the Palmbla Carbureter 1910, Model "D."

The cut shows the carbureter in operation at the highest motor speed. Valve "A" is raised as shown. In this position, the spray nozzle is in the center of the full carbureter area air tube at "K". Valve "A" has a small tube running through its center, and in throttling motor, it lowers and closes tube "K" (shown in cut by dotted lines). The spray nozzle now at once comes under the influence of the smaller tube "L" at its center continuing the sharp draft of air past the fuel nozzle as in the high motor speed.

These tubes open and close in direct ratio to the motor speed automatically increasing or decreasing the volume but not the speed of the air past the feed nozzle.

Valve "A" is controlled by a compensating spring having just enough tension to keep it seated at the slow speed.

This carbureter is manufactured by the North Chicago Machine Company, North Chicago, Ill. It is made in ½, ¾, 1, 1¼ and 1½ inch sizes, and can be had with either top or side outlet.

---

Mr. J. Z. Evans has resigned his position as General Sales Agent of the Automobile Department of the Abendroth & Root Mfg. Co., makers of the Frontenac cars.

## "READ" TERMINALS

The accompanying cuts illustrate two sizes of the Read Terminals, manufactured by H. P. Read, 45 Kingston avenue, Brooklyn, N. Y. These terminals are made in three sizes, i. e., large for secondary, medium and small for primary wires. They are easily attached and make a perfect electrical connection.

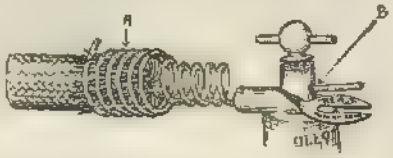


Fig. 1. "Read" Terminal; large size, for secondary wires.

About four coils of the spiral portion of the terminal are simply screwed upon the strands of wire which have been laid back evenly over the outside of the insulation as shown at "A," Figs. 1 and 2 thereby making an easy repair possible, and a perfect electrical contact with each and every strand.

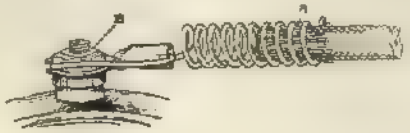


Fig 2. Small-sized "Read" Terminal for primary wire.

The wire projecting from the left is a spring wire extension, which can be used to prevent the loosening of the nut as shown in Fig. 2. They list at 10 cents each.

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## EMPIRE BRAKE LINERS

The Empire Tire Co., of Trenton, N. J., have put a brake liner on the market which is manufactured of long stapled asbestos which offers the highest co-effi cient of resistance to the lowest percentage of wear. The asbestos cloth is held together by a thin coating of rubber which is compressed under a hydraulic pressure of not less than two thousand pounds per square inch for vulcanizing. It is furnished in nine widths from 1 inch to 4 inches, and in ⅛, 5-32, 3-16 and ¼ inch thicknesses

---

The Slack Manufacturing Company has been formed at Springfield, Vt., to manufacture Abrasive Metal Cutters. The partnership consists of W. W. Slack, president, Gilman & Son, Inc.; H. K. Parkman, secretary, Gilman & Son, Inc., Springfield, Vt., and G. C. Parker, sales manager, Wm. J. Smith Company, New Haven, Conn., all of whom will retain their present positions with their respective companies.

## "AUTOMATIC" BREEZE CARBURETER

**For the Smallest Motors up to Largest Heavy Duty Engines**

Independent adjustments on top in plain sight and handy. Adjustable to any motor—adjustments stay put—wearing parts made large—necessary connections supplied for fuel and manifold—brass float—positive float feed mechanism—easy starting—central draught—venturi tube construction. Patented needle valve for economy. Special carburetors for popular motorcycles. Ford, Maxwells, Buick No. 10, Dorris, etc.

Motor owners ask your dealer for a Breeze Carburetor and Strainer. If he hasn't one write us direct.

**RETAIL PRICES**

| | |
|---|---|
| ¾ in. pipe size .. | $10.00 |
| 1 in. pipe size .. | 12.00 |
| 1¼ in. pipe size .. | 14.00 |
| 1½ in. pipe size .. | 18.00 |

*Ask for our Descriptive Matter!*

## BREEZE FUEL STRAINER

Easily taken apart. Positive in action and big enough to do the work required. The fuel to be strained runs up and through fine meshed gauze under which dirt and water settle and is drained off occasionally. To strain gasoline into a tank is very necessary but tanks sweat and corrugate moisture and they sometimes rust. Galvanizing and solder chip off, corrugation loosens dirt in the fuel pipe. The strainer is equipped with drain cock, washer, and with union nut and tube if desired. Gasoline, water, galvanizing, tank rust, loose chips, piping, etc. To save trouble and be sure of your engine, now use a regular supply of fuel, install a good strainer of BREEZE CO.'s size right into up to the carburetor. Two holes in these are furnished on either ¾" or 5-16" for use where it is required to solder the fuel pipe in the strainer. *Price $1.50 on either ¾" or 1" pipe size.* JOBBERS and DEALERS Get our Discounts and Handle our Goods. *We furnish electros for catalog illustrations.*

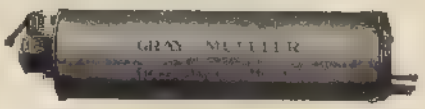
Ask for our Descriptive Matter!

**BREEZE CARBURETER CO., 271 Halsey St., Newark, N. J.**



# IS IT A GRAY—

## OR AN IMITATION?




The Efficiency, Appearance and Demand for the

## GRAY MUFFLER

has caused makers of Freakish Catch Name mufflers to discard their Theories and imitate the Practical and Quiet GRAY.

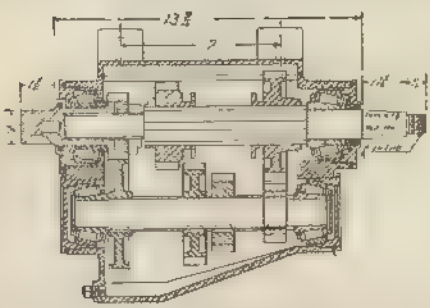
The above shows a Gray model introduced in 1907. Note the cut-out in front head, the collector and tail pipe at rear—note its general appearance and how closely it is NOW imitated.

There's a reason—The GRAY Muffler is Popular. It Sells and gives Satisfaction. All Good articles are imitated, but the Material, Workmanship and Square Dealing which made the Original a Success are not found in imitations. Our 1907 model was right—Service has proven it. Our 1910 is better. It is 3 years ahead of our imitators. Buy the original from the originators and secure the best. The cost is but little more. Write for catalogue, Muffler Department.

**GRAY-HAWLEY MFG. CO.**
**DETROIT, MICH.**
**Motor Car and Motor Boat Accessories**



# B-T-K PARTS



**Five styles of selective transmissions for 1909-10; also selective and progressive side levers; cone clutches,** bronze or leather face, with or without cork inserts; **Universal joints; steering gears;** and **brass plating done to order. We make parts to your designs** and are designing new parts for 1910. **We make a specialty of gear cutting** where blanks are furnished.

Write for catalogue and prices.

**Auto Parts Manufacturing Co.**
**MUNCIE, IND.**

# SEE THAT GAP

**One of the Many New Attractive Features Making**

# VASCO WIND SHIELDS

**an ornament and necessity on every car. No Springs. Automatic. One hand control. Take no chances—Buy the BEST. Ask for Catalogue A and prices.**

**Victor Auto Supply Mfg. Co., Inc.**
**42 West 43rd Street, NEW YORK**
**Factory: Providence, R. I.**

# HIGH GRADE AXLES
## FOR MOTOR CARS

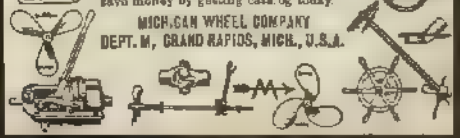
Ever notice how many manufacturers, in giving specifications of their car, say—"Timken Roller-bearing Axles?" They know, as *you* know, that axles of Timken Quality are the best axles that can be made. Correct in design and principle. "Some car owners have axle troubles—others use Timken Axles."

Made in Detroit By
THE TIMKEN-DETROIT AXLE CO.

Aluminum, Bronze, Manganese Bronze
**CASTINGS**
"SUPERIOR" BABBITT
"PLATA" WHITE BRASS
25 YEARS' EXPERIENCE
ROCHESTER New York
**CLUM & ATKINSON**

**GET THIS CATALOGUE**

SAVE MONEY The largest in the world SAVE MONEY
on speed propeller wheels, reverse gears and marine hardware.
**Everything new and up-to-date**
We want every man who builds, owns or sells a boat to get our 86 page free catalog. Prices right and all goods guaranteed, immense stock, prompt shipments. You save money by getting catalog today.
MICHIGAN WHEEL COMPANY
DEPT. M, GRAND RAPIDS, MICH., U.S.A.



**Monitor Solid Tire Motor Vehicles**

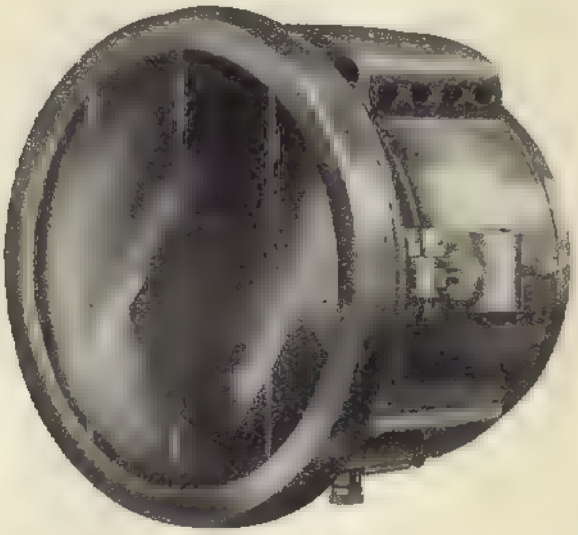
Surreys
Runabouts
Express
and
Commercial
Cars.

Write for 1909 Catalog.

**Monitor Automobile Works**
1594 N. Halsted St., Chicago

# *All* SOLAR

## Lens Mirror Searchlights



And Projector Headlights are fitted with Bausch & Lomb short Lens Mirror Reflectors. They have been PROVEN by actual photometric tests to be the **most powerful ever used for motor lamps.** Consider the satisfaction in having the BEST the lamp industry produces. Do not accept an imitation of SOLARS. WE KNOW there are none better WE want YOU to know it—we want you to PROVE it by using SOLAR LAMPS they are STANDARD!

**THE BADGER BRASS MFG. COMPANY**

Two Factories:

Kenosha, Wis.

437 Eleventh Ave., New York

# The Automobile World Recognizes

# SOLAR LAMPS

## as Standard

¶ **OVER 20 AMERICAN MANUFACTURERS** equip with Solars, because they enhance the value of every car and improve its appearance.

¶ **DEALERS** recommend Solars, because they give absolute satisfaction—and satisfaction means permanent customers.

¶ **OWNERS AND DRIVERS** prefer Solars, because they are absolutely dependable under all circumstances - they make touring at night safe and enjoyable.

**The Badger Brass Mfg. Company**

**Two Factories:**
**KENOSHA, WIS.**
**437 Eleventh Ave., N. Y.**

# SOLAR

## LAMPS

"SHOW THE WAY"

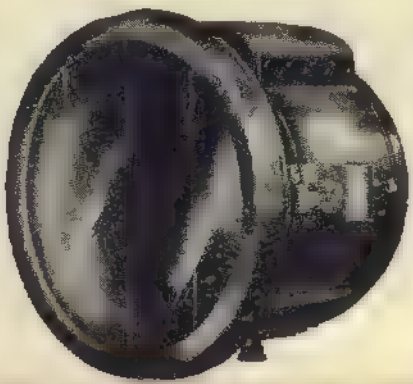
## YOU WILL EVENTUALLY BUY

# SOLAR LAMPS

Why not purchase them at once? Why not buy good lamps at the start? The difference in price between Solar Lamps and the imitation or lamps of "ordinary" quality is now so slight that you cannot afford to drive without Solars.

You may try different makes of motor lamps—you may experiment—but you will eventually buy Solar Lamps. Every one does, because they are absolutely perfect because they are the best money can buy.

INSIST UPON SOLAR EQUIPMENT. THEY "SHOW THE WAY" FOR ALL MOTORISTS "WHO KNOW"



**Badger Brass Mfg. Company**

TWO FACTORIES:

KENOSHA, WIS.

437 Eleventh Ave., NEW YORK

## A New Departure

# Shaft Drive

**BEVEL GEAR—ON ALL**

# Baker Electrics

## THE ONLY SHAFT DRIVEN ELECTRICS

***The Greatest Advance Ever Made in Electric Motor Cars***

After many years of experimenting we have perfected a shaft drive, which excels any chain drive in efficiency, and have adopted this new transmission, because of its unquestioned superiority over every other type. This is in accordance with the practice of all high grade gasoline motor car manufacturers, both American and foreign.

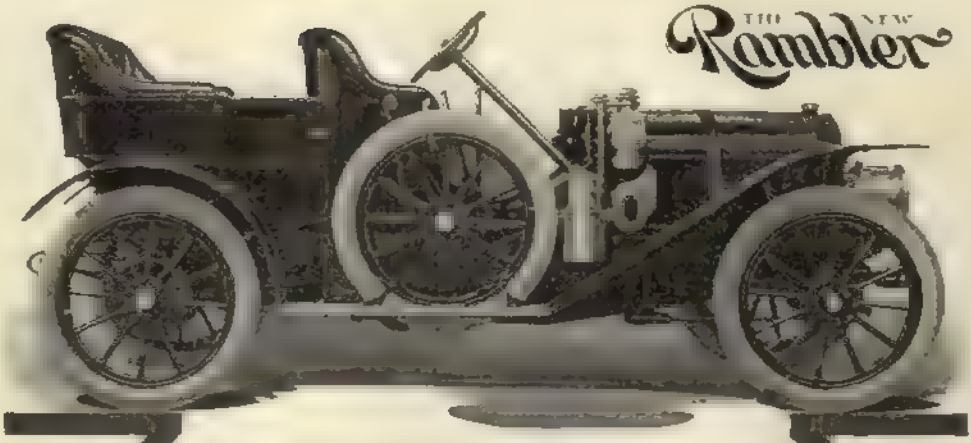
***We Now Present For the First Time***
***A COMPLETE LINE OF SHAFT DRIVEN ELECTRICS***

Write for booklet giving specifications and full information regarding our many other exclusive improvements.

## The Baker Motor Vehicle Co.

35 *West 80th Street* *CLEVELAND, OHIO*

*THE OLDEST AND LARGEST MANUFACTURERS OF ELECTRIC MOTOR CARS IN THE WORLD*




Model Fifty-three 36 H. P. $1,800, with Magneto, Lamps and Tools.

MODEL Fifty-three, at $1,800, except for improvements, is identical in quality and power with previous Rambler models which sold at $2,250.

Capacity Five-passenger.
Engine Four-cylinder, 4½ x 4½ thirty-[illegible] horsepower
Wheel base 108 inches
Spare wheel with tire brackets and tools $75

Wheels and tires 36 in. x 3½ in
Color: Dark Brewster green body with cream wheels
Equipment magneto, oil side and tail lamps, gas head lights and generator horn. Full set of tools and jacks

## Model Fifty-four

Model Fifty-four, forty-five horsepower, at $2,250, except for body capacity, is practically a duplicate of Model Fifty-five

Capacity Five-passenger
Engine [illegible] cylinder, 6 x 5½ forty [illegible] horsepower
Wheel base 117 inches.

Wheels and tires 36 in. x 4 in
Color: Light Brewster green and [illegible] wheels.
Equipment Same as Model Fifty-five

# Thomas B. Jeffery & Company

Main Office and Factory, Kenosha, Wis.

Branches and Distributing Agencies:
Chicago, Milwaukee, Boston, Cleveland, San Francisco. Representatives in all leading cities.

THE CAR OF STEADY SERVICE

# Baker Electric Vehicles

The Aristocrats of Motordom

BAKER ELECTRICS have given the electric vehicle industry its reputation.

The great Baker factory, devoted exclusively to the manufacture of Baker Electric Vehicles, is the largest of its kind in the world, and employs the most eminent experts in every department of construction.

Baker Vehicles are the height of excellence in equipment, appointments, luxurious furnishings, and that unusual care to details, which makes them the most extraordinary cars in durability, and mileage capacity.

## A Few Baker Features Are

*Unequaled economy in the use of Electric Current.*
*Batteries in series at all speeds.*
*Longest life of the battery.*
*Quiet center-chain drive.*
*Perfect alignment under all conditions.*
*Lowest transmission loss.*
*Exide batteries standard equipment.*

These and many other points of superiority make the Baker the standard of electric vehicles.

## We Want Reliable and Progressive Agencies

in every city where we are not already represented. **Send for Catalog** describing the many popular Baker Models:

Gentleman's Runabout—(*The electric sensation of 1909.*)
Lady's Coupé (*roomy four passenger car.*)
Queen Victorias, Landaulets, Broughams, Surreys and Commercial vehicles.

**Baker Motor Vehicle Company,**
**35 W. 80th Street, Cleveland, Ohio.**

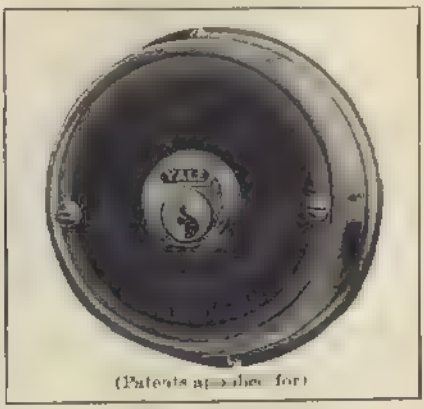
New York Salesroom, 1188 Broadway.
Chicago Salesroom, 1714 Michigan Av.



THE

# Safety Lock-Switch

for gasoline cars offers to automobile owners absolute protection from theft, tampering and unauthorized use. The lock cylinder itself operates the switch and the key takes the place of the plug.



(Patents applied for)

1. Easy to install.
2. Simple to operate.
3. Neat in appearance.
4. Unfailing in purpose.
5. The best device of the kind on the market and the most inexpensive.

**To be Sold at Retail for $5.00**

Write for Folders and Prices to

## The Britton & Carleton Mfg. Co.

Also Makers of the Safety Lock Switch for Electric Vehicles

**311-312 Caxton Building**
**CLEVELAND, Ohio**

# A DIFFERENT KIND of ACCESSORY STORE

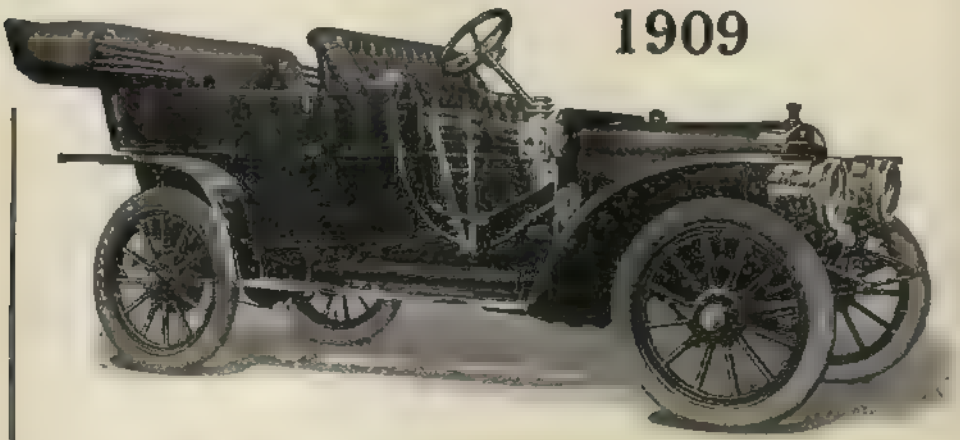
DEALERS, OWNERS AND REPAIRMEN, SEND FOR OUR NEW VOL. 3, 1909-10 AUTOMOBILE ACCESSORY CATALOG. THE MOST COMPLETE BOOK ON ACCESSORIES THAT CAN BE SECURED FOR THE ASKING :: :: :: :: ::

## AUTOLIGHT & MOTOR SUPPLY COMPANY, Inc.

506-8 N. BROAD ST., PHILADELPHIA

Dorris

1909



3-Point Suspension

Valves in Head

**Price, $2,500**

DORRIS MOTOR CAR CO. :: :: ST. LOUIS, MO.

## "SERVICE" BREEZE CARBURETER

**Best for Marine and Stationary Motors**

Two buttons for all adjustments—the throttle does the work. The "SERVICE" adjustments are simplest of any known turn one button marked "High" for perfect high speed results and turn the other button marked "Low" for perfect low speed results. THAT'S ALL. The adjustments once made stay right. Air supplies fixed—auxiliary air is away from dirt, water and oil—petcock for drainage

## "AUTOMATIC" BREEZE CARBURETER

**Best for Automobile Motors**

Independent adjustments on top plain sight and handy. Adjustments do not affect each other—adjustments stay put—wear or parts make larger necessary compensations supplied for. Dual and manifold—cast integral with water jacket—central downdraft—venturi fixed construction. Fitted with throttle valve for economy. Special carburetors for pumps, air motorcycles, Ford, Buick, Buick 6-40, Dorris, etc.

Motor owners ask your dealer for Breeze Carburetor. Simplicity of the Breeze construction does away with dirt.

RETAIL PRICES — EITHER MODEL

| | |
|---|---|
| ¾ in. pipe size | $11.00 |
| 1 in. pipe size | 12.00 |
| 1¼ in. pipe size | 14.00 |
| 1½ in. pipe size | 18.00 |

*Ask for our Descriptive Matter.*

Jobbers and Dealers: Why don't you handle our goods?

BREEZE CARBURETOR CO., 271 Halsey St., Newark, N. J.

# We Only Make

AUTOMOBILE AXLES
HUBS AND RIMS

**But make more than any other manufacturer in the world**

**Hubs** BALL AND ROLLER BEARING

**Axles** FRONT AND REAR I-BEAM or TUBULAR

**Bevel or Chain Driven**

Doing this work as a specialty, with tools and equipment designed especially to the product made, gives us an advantage in cost of production that makes it possible to quote you interesting prices. May we?

Send for catalog

## Weston Mott Co.

Established 1884

FLINT, MICH.

# MONOGRAM OIL

Produces the greatest amount of motor efficiency under the most trying conditions. A trial will convince you

*Manufactured Solely by*

**The Columbia Lubricants Co. of New York**

116 Broad Street New York City

*Sold by All First-Class Dealers*

# EISEMANN

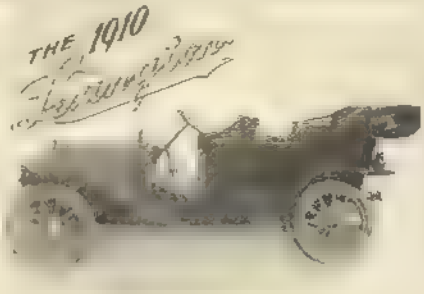
**HIGH TENSION SYSTEM**

# MAGNETOS

Make motoring a pleasure by eliminating ignition worries

**LAVALETTE & CO.**

112-114 West 42d St., N. Y.



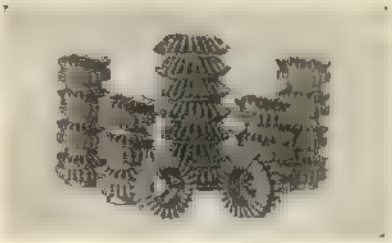

**$2500**

The dealer who is looking for a good, paying proposition for next season should study the "Lexington," and what it has to offer him. It is a high-grade, serviceable, satisfactory motor car, selling at a right price.

In addition to the Touring Car illustrated, we make a short-coupled Body and Regular Roadster at the same price.

Let us send you full particulars.

**The Lexington Motor Car Co., Inc.**
**LEXINGTON, KY.**



# Accurate Gears

We can furnish all kinds of accurately cut gears, either in quantity, or single orders for repair work.

Let us quote you.

THE
**New Process Raw Hide Co.**
SYRACUSE, N. Y.

They Button on
**ALLEN TIRE COVERS**

Found on practically every car. Absolutely necessary. Endorsed by all drivers and owners who appreciate quality. Made of ENAMEL DUCK —not DRILL.

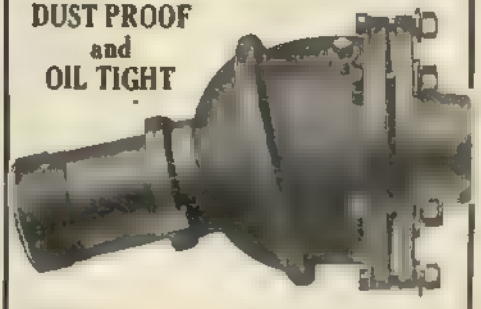
Covers for all makes of Demountable Rims and Spare Wheels.

ALLEN TIRE LOCKS
NONE BETTER MADE
ALLEN TIRE HOLDERS
ADJUSTABLE—DETACHABLE

**THE ALLEN AUTO SPECIALTY CO.**
Manufacturers
1926 Broadway, New York City

# Spicer Universal Joints

**DUST PROOF and OIL TIGHT**

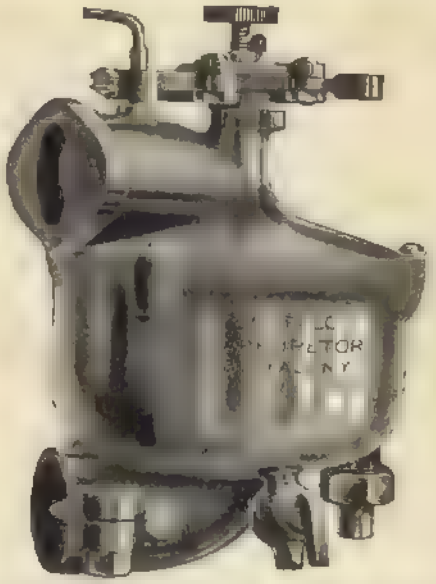


Will run 3000 to 6000 miles with one lubrication. **Prices are right.** Write for information.

**Spicer Universal Joint Mfg. Co.**
3 Madison Ave., Plainfield, N. J.

Sales Representatives:
K. FRANKLIN PETERSON, 166 Lake St., Chicago
L. D. BOLTON, 319 Hammond Bldg., Detroit
T. J. WETZEL, 17 W. 42d St., New York

# The Buffalo Carburetor



## IT DOES THE WORK!

That's the whole thing in a nut-shell, and the secret of the Buffalo's wonderful popularity.

The BUFFALO is a mechanical carburetor in all that the term implies; flexible and reliable.

It is economical in gasoline consumption, saving from 20 to 50%.

It gives complete control of the motor at all times.

It increases the mileage by producing greater horse power per gallon of fuel.

Neither vibration nor atmospheric conditions have any effect upon it.

The leading cars are all equipped with the BUFFALO.

Are yours?

Our increased facilities enable us to guarantee prompt deliveries. Better get quotations for your 1910 output.

## Buffalo Carburetor Co.

Grand River Ave. & Stanton Street, Detroit, Mich.

# Do You Intend to Use the Same Old Carburetor That Gave You Trouble Last Year?

If you buy your carburetors before you try

**THE BUFFALO**

you will run the risk of being disappointed.

**The Buffalo** has more good points than any other carburetor on the market and we are ready at any time to prove to you that it is **an absolutely mechanical carburetor; that it is not affected by vibration nor atmospheric conditions; and that it positively will increase power and mileage.**

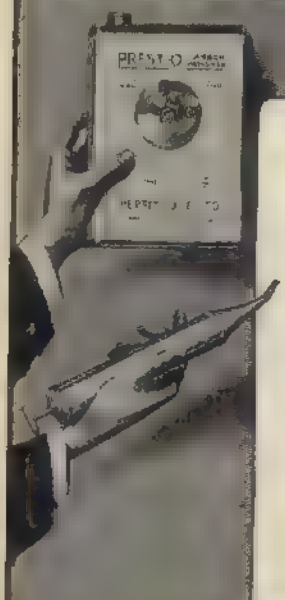
The prominent manufacturers who are to-day using **The Buffalo** on their cars, would not do so if it did not substantiate all our claims. You will make no mistake in following their lead.

*WRITE FOR PRICES AND PARTICULARS*

**Buffalo Carburetor Company**

Grand River & Stanton Aves. **Detroit, Mich.**

# Prest-O-Carbon Remover



## Don't Tear Down Your Engine!

An engine torn to pieces and scraped is seldom as good as before. Prest-O-Carbon Remover chemically dissolves and removes every particle of carbon from cylinders, pistons, piston rings and valves.

## For Auto, Marine and Stationary Engines

Cannot injure the metal. Cleans one cylinder perfectly in an hour for 25 cents or less. Increases compression, power and durability. Does a better job than scraping. Simply apply with an oil gun.

**We Will Refund Your Money** if Prest-O-Carbon Remover doesn't do all we claim for it. Price: Gallon, $3.75; Half Gallon, $2; Quart, $1. Beware of imitations containing kerosene or strong acids. If your dealer does not supply you promptly, send your order to us, to be shipped from our nearest office.

**The Prest-O-Lite Co.** 237 East South Street INDIANAPOLIS, IND.

*Makers of Prest-O-Lite Tanks*

Branches at New York, Boston, Philadelphia, San Francisco and Toronto

***Mr. Dealer: "Good Goods" Always Pay Best***

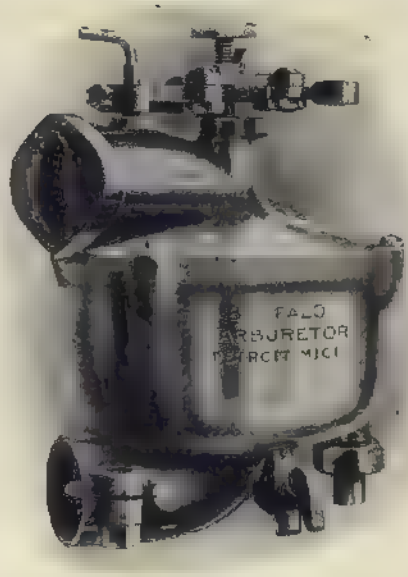
¶ As well try to get blood from a stone as power and speed from an engine with a poor carburetor.

**Is it the carburetor that has been standing between you and success?**

IF SO, EQUIP YOUR 1910 CARS WITH

# The Buffalo

THE MECHANICAL CARBURETOR



¶ You will be surprised at the increased power and mileage.

¶ The BUFFALO is an absolutely mechanical carburetor,—simple, substantial, economical, powerful,—not affected by vibration nor atmospheric conditions.

¶ Give it a trial. It will back up all our claims.

**Buffalo Carburetor Company**

**Grand River Ave. & Stanton St., Detroit, Mich.**

# AIR COOLED

**CAMERON FOURS** 24 H. P., 5 models: Runabout, $950; Roadster, $985; "Featherweight Flyer," $1000; Surrey, $1050; Touring Car, $1100.

**CAMERON SIXES** 36 H. P., 4 models: Touring Car, Runabout, Roadster and Flyer—all $1500.

All prices include High Tension Magneto, full lamp equipment, etc.

**24 H. P.**

CONSIDER THE POWER IN PROPORTION TO WEIGHT

**4-Cyl. Surrey, $1050**

Rear Seats Detachable Wheel Base, 104 in. Tires, 30 x 3½ in

**1300 lbs.**

¶ CAMERON AIR COOLED MOTORS are passing through the seventh year of their development, and they stand today absolutely superior in point of efficiency and economy to any motors on earth of same piston displacement.

¶ CAMERON DIRECT DRIVE TRANSMISSIONS, built integral with rear axle, show less absorption of power on all speeds than any system now in use.

¶ CONSIDER, If you are a dealer, that our line is complete and distinctive and when competition is keen, as it will be from now on, this factor will be greatly in favor of our goods from a selling standpoint.

¶ CONSIDER, If you are a user, THE ADVANTAGE of an air-cooled motor, which will do its work successfully regardless of climatic conditions; THE ADVANTAGE of a Direct Drive transmission system, that absorbs a minimum amount of power, placed on the rear axle, giving a firm grip on the road, no matter what the surface or speed conditions; THE ADVANTAGE of a light car, eliminating tire troubles.

¶ THE ADVANTAGE of the combination of all these points the sum of which is low cost of operation.

**36 H. P.**

CONSIDER THE POWER IN PROPORTION TO WEIGHT

**6-cyl. Touring Car, $1500**

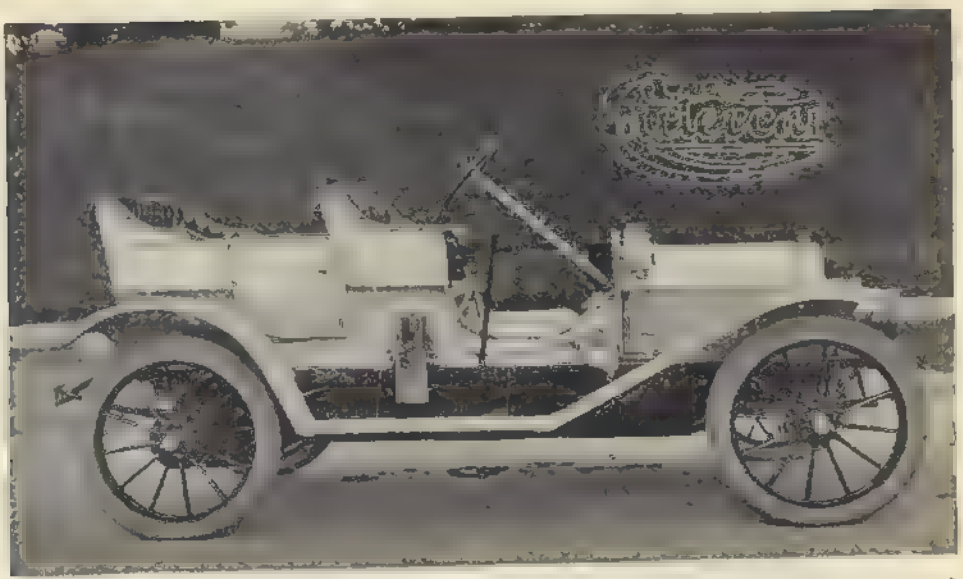
Wheel base, 114 in. Tires, 34 x 3½ in.

**1675 lbs.**

Our new literature is now ready, you will find it interesting. WRITE

# CAMERON CAR COMPANY

GENERAL OFFICES **BEVERLY, MASS.**



# NO clutch to slip--NO gears to strip--NO grease packing to renew--NO shafts to twist--NO universal joints to wear--NO bevel gears to howl--NO noise--A thousand speeds--And only one control lever, that's a Cartercar.

The Cartercar will climb a 50% grade with a full load and do it easily.

The Cartercar will move behind a loaded truck on a city street, or travel as fast as you wish on a country road on high gear.

All of these things are possible in the Cartercar because of its friction transmission and chain-in-oil-drive.

The Friction transmission will stand a large amount of careless handling by the inexperienced without injury.

The fibre facing on the friction wheel will wear for upwards of 4,000 miles, and a new one lists at $3.00.

A case protects the chain from dust and grit and permits it to run in an oil bath.

This makes the chain wear for years.

Nearly all of the power of the Cartercar is delivered to the rear wheels, enabling it to do what other cars cannot

They are simple to learn to operate easy to care for, and economically maintained

All models come equipped with magneto, gas lamps, generator, oil lamps, horns, mats, tools, jacks, and tire kit.

Model "H," with single rumble seat, $1,100. With double rumble seat, $1,125. With double divided rear seat, $1,150. With miniature tonneau, $1,150.

Model "L" touring car, $1,600.

C. A. T. J.

## Cartercar Company

**40 Franklin Rd. - Pontiac, Mich.**

## Mail To-day

Cartercar Co.,
Pontiac, Mich.

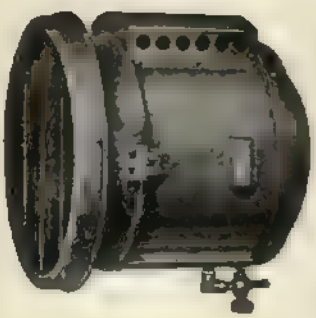
Gentlemen

Please mail me your new 1910 Catalog describing and illustrating your complete line

Name .....

Address .....

# OUR POLICY



To make Rushmore Lamps the best light-givers—

To make them the most durable—

The easiest to repair—

The cheapest to maintain—

The best insurance for night motoring—

To sell them at a fair price—

To make the owner of Rushmores want them on his next car—

To make our profit in factory economies, not in quality cutting—

To better our product whenever we saw a chance to do so—

To see how much we could save our customers—not how much we could make them spend—

To make the best generator in the world, and one of which we could afford to be proud—

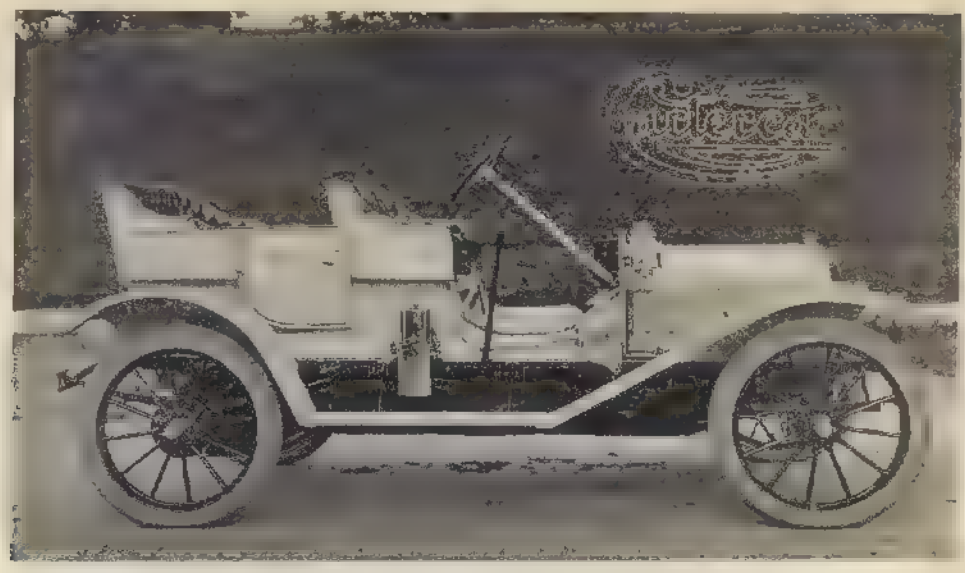
To give a square deal and demand one—

Such has been our policy and our ambition since the first Rushmore Navy Standard Automobile Searchlight was made in 1900. It is our policy and our ambition still.

## RUSHMORE DYNAMO WORKS

PLAINFIELD, NEW JERSEY

CHICAGO, ILL. LONDON PARIS



# A Splendid Hill Climber, a Quiet, Smooth-Running, Powerful, Little Four Cylinder Model "H" (with Miniature Tonneau), $1,150

¶ This little car is the surprise and the delight of all who ride in it. It is a high-grade automobile in every particular.

¶ It will climb a fifty per cent hill with a load.

¶ It runs as quiet as can be. It runs so smoothly that you would hardly know it was passing on the street.

¶ The motor has four cylinders, 4-inch bore and 4-inch stroke. We claim for it 22 horse power.

¶ This car will climb, runs quietly, is easy to handle, costs little to maintain, will travel farthest on a gallon of gasoline, requires little oil, and is the best to buy for these reasons:—

¶ All CARTERCARS are equipped with our Friction Transmission and Chain-in-Oil Drive.

¶ This transmission and drive delivers a large percentage of the motor power to the rear wheels.

¶ It makes the car easy to care for and maintain, because there is no clutch to slip, no gears to strip, no grease packing to renew, no universal joints, no bevel gears, no noise, and it has only one operating lever.

¶ It is equipped with magneto, gas lamps, generator, oil lamps, horn, tools, jack, and tire kit.

¶ With single rumble seat the price is $1,100. With double rumble seat, $1,125. With miniature tonneau, $1,150. All are interchangeable. Write

## Cartercar Company

**Pontiac, Michigan** **Member A. M. C. M. A.**

# The Four-Cylinder Reo

## A high-powered car rich and handsome —for $1250

You Can do it with a REO

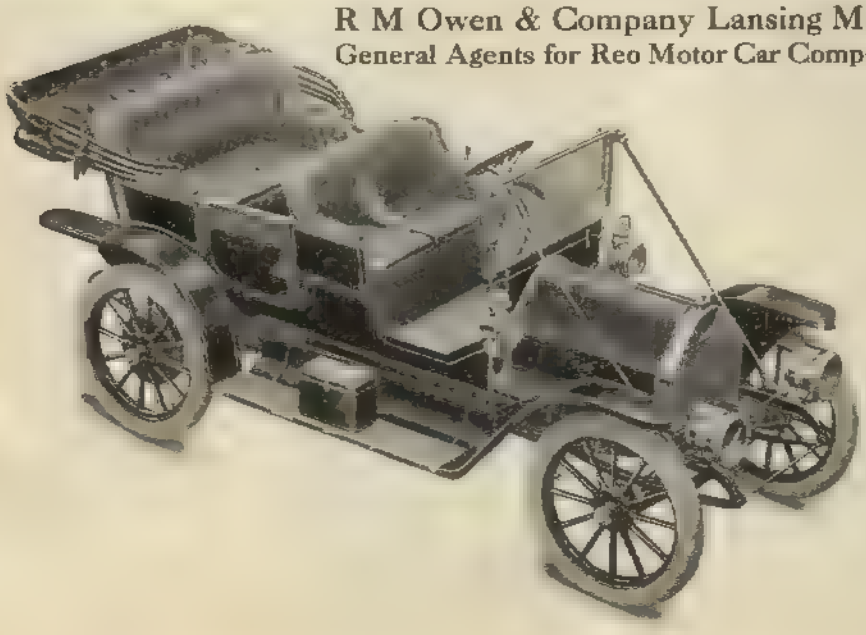
This car, at this price, is so remarkable an achievement that the thinking man will want it explained. The 1910 Reo catalogue (now ready) tells bottom facts and reasons why. Here are only a few:

A vast amount of power developed in a long stroke motor (4x4½) with big intake and exhaust valves (one at the top, and one on the side of the cylinder) letting in and discharging a great amount of gas. Every working part of the car is thought out and developed to the last degree of perfection, and is machined down to the ultimate possible refinement. We put the costs where they count for power and effectiveness. A strong effective pump that rapidly sends a great amount of water straight to the point where it is most needed (the exhaust valve) before cooling the rest of the motor. The cam gears are designed to open the valves more quickly than they have ever been opened before in any car. Lubrication system, without waste or contamination of oil, puts it where it does the most good (the main bearings of the motor and the face of the cam gears) and afterwards sends a proper amount of oil spray to the working side of the cylinders and pistons. The clutch positively engages and releases at the will of the operator. The whole working mechanism of the car from stem to stern is protected from dust, with the leakage of oil made almost impossible. The saving of friction has been worked out and is exemplified in this car on an extraordinary degree. Another great power-waster—lost motion—is avoided first, by great refinement in manufacture, and second, by making possible quick adjustments of all parts likely to become loose—the connecting rods and main bearings, for example (easily reached through a hand hold in the crank case), the bevel gear (easily reached through the rear axle housing), and so on throughout the entire mechanism.

30 horse-power, 50 miles an hour if you want it, perfect action on the hills everything you want in a car, including economical up-keep. The driver's seat and control are on the left —which is the right place for them.

*Send for the Catalogue*

**R M Owen & Company Lansing Mich**
**General Agents for Reo Motor Car Company**



tourists than in other countries; especially if you forget and kick a dog just because he bites a hole in your calf as you ride along. Steer clear of Spain.

Altogether the motorcycle is ideal for touring and its reliability a surprise. In all the thousands of miles I covered—and my wife rode on a back seat attachment for a greater part of the ride—my repairs were less than a dollar, and I never had to walk to town through my machine giving out. One will forget gasoline once in a while, and that was the biggest fault that I found with my R. S.—it wouldn't run without fuel!

Hoping these suggestions may be of use to some other one so fortunate as to be able to make a real motorcycle tour, I am

Very truly yours,

ST PAUL MINN WM B STOUT

## VALUE OF 2 SPEED GEARS

[433] Inclosed find a circular of motorcycle transmission. I would like your advice as to whether you think such a device would have any future if sold at from $30 to $35.

CLEVELAND, O. C. A. LOEW

We regret we cannot give an opinion on the device you mention, as we know of no one who has used it in this part of the country. We believe there is a very large future indeed for the two speed gear machine, but we are also inclined to think that the two speed will not be very popular until the manufacturers themselves adopt it, and fit it as standard with their motorcycles. There is no reason, however, why the device you mention, if it will perform the work satisfactorily should not meet with considerable sale.

## RAILROAD RATES VARY

[414] Will you please advise me on the following points: First, where can I get information relative to the carrying of motorcycles on trains? Second, can you refer me to a simple text-book on motorcycle mechanism? Third, is there an association in New York City of motorcycle riders, and if so, what is the name thereof?

NEW YORK, N. Y. L. H. WOLFE

The rule with regard to carrying motorcycles on trains varies with the railroad. This matter should be taken up directly with the railroad in question.

The Motorcycle Illustrated, 299 Broadway, N. Y., issues a booklet, descriptive of the motorcycle. The price of this booklet is 25 cents.

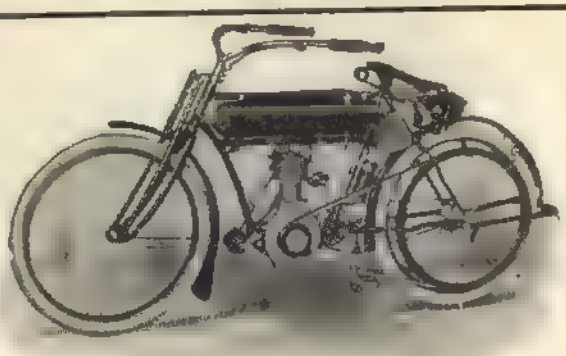
There certainly is a very live association of motorcyclists in New York City. In other words, it is our New York Motorcycle Club. We cordialy invite you to come to any of our meetings which occur at 8.30 on the second Wednesday and fourth Thursday of each month. The club rooms are 2234 Broadway, New York City. —Tech. Comm.


THE '09 YALE

3½ H. P.

MOTORCYCLE

IS THE BEST



You need this agency. $200 F. O. B. Toledo

You can make money selling the Yale 3½ H. P. motorcycle.

It embodies all the desirable features of the highest priced machines and sells at a figure in reach of all.

WRITE TODAY FOR FULL INFORMATION. YOU!

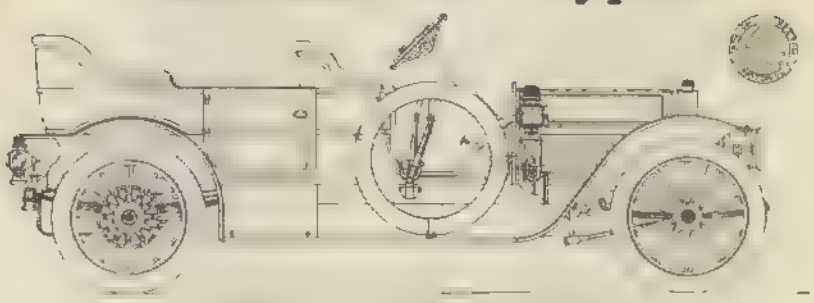
The Consolidated Mfg. Co., 1710 Fernwood Avenue TOLEDO, OHIO

We also make YALE and SNELL bicycles, RUSSEY handle bars, CONSOLIDATED PACKAGE CARS and DROP FORGINGS of every description.

# Croxton-Keeton Cars

## For 1910

## "German 45" Types



GERMAN 45 TOURING CAR, $3500

GERMAN 45 ROADSTER, $3500

Each model has 45 H. P., 4 cylinder vertical engine. Dual ignition system, with Bosch High Tension Magneto. Selective sliding gear transmission. Three speeds forward and reverse. Wheel base, 130". 36" wheels. Tires, 4" front and 4½" rear—any standard make. Furnished with 7-passenger touring body, $3500; 5-passenger, close coupled, $3500; 3 or 4 passenger roadster, $3500; 7-passenger limousine, $4000.

Our line also includes the French 30 models—4-passenger suburban, $2850; 6-passenger touring car, $3250; landaulet, $3300, brougham, $3500.

**DEALERS**—don't close for your 1910 cars without first thoroughly investigating the **CROXTON-KEETON** line, and getting our proposition.

## The Croxton-Keeton Motor Co.

### Massillon, Ohio

NEW YORK
1662 Broadway

PITTSBURGH
5920 Baum St.

CLEVELAND
2174 E. 9th St.

PROVIDENCE
430 Broad St.

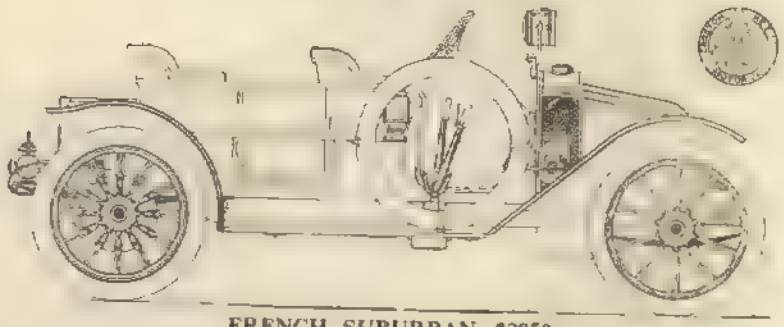
TOLEDO
233-7 Ontario St.

KANSAS CITY
425 Delaware St.

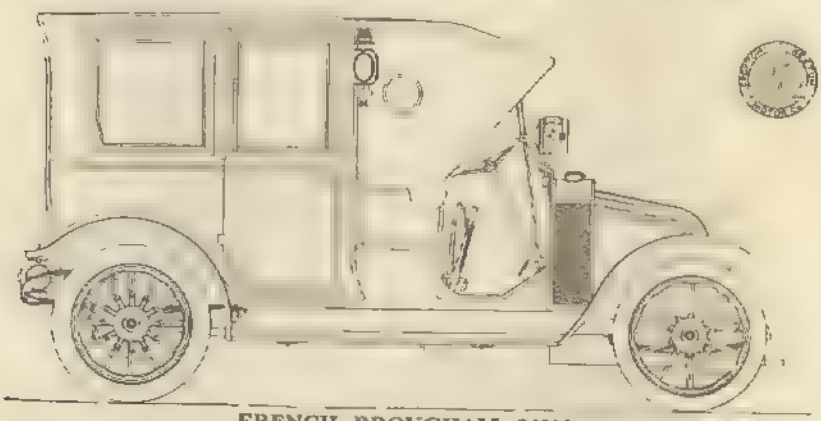
CHICAGO, Michigan Ave. and 21st St.

# Croxton-Keeton Cars

## FRENCH TYPE



FRENCH SUBURBAN, $2850



FRENCH BROUGHAM, $4000

Each model equipped with 30 H. P. 4-Cylinder Vertical Engine, dual ignition system, with Bosch High-Tension Magneto, Selective Sliding-gear Transmission, three speeds forward and reverse. Wheel base, 115½ inches, with 36" wheels on country cars and 32" on town cars. Chassis furnished with 6-passenger Touring Car, $3250; 4-passenger "Suburban," $2850; 7-passenger Brougham, $4000; and 4-passenger Landaulet or Taxicab body, $3300.

Our line also includes "German 45's" in four models: 7-passenger Touring Car, $3500; 5-passenger Close-coupled, $3500; 3 or 4-passenger Roadster, $3500; and 7-passenger Limousine, $4500.

**Dealers** would do well to **investigate** the **Croxton-Keeton** line before closing for 1910.

## The Croxton-Keeton Motor Co.

### MASSILLON, OHIO

NEW YORK
1662 Broadway

CLEVELAND
2174 E. Ninth St.

LOS ANGELES
842-6 Olive St.

TOLEDO
233 Ontario St.

CHICAGO
2035 Michigan Ave.

BOSTON
Motor Mart

KANSAS CITY
425 Delaware Ave.

PROVIDENCE
430 Broad St.

SALT LAKE CITY
225 S. W. Temple St.

PITTSBURG
5[illegible] Baum St.

DENVER
323 McPhee Bldg

SEATTLE
1319 Fifth Ave

# *Thousands of Satisfied Users Can Testify to the High Quality of the*

# COMMON SENSE PLUG

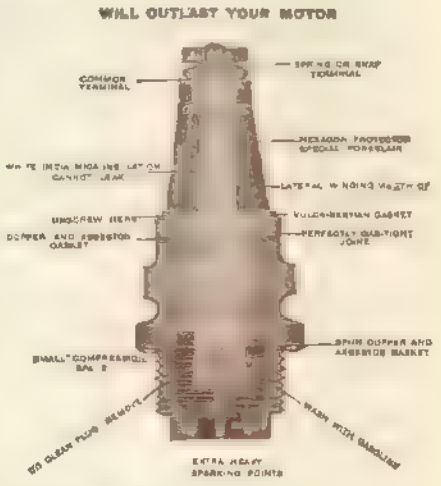
This Plug, which is really a Mica Plug and whose construction is clearly shown on this page, has jumped into popularity with the users of gasoline motors in a manner which leaves no possible doubt that the Plug is made on the right lines. Those motors which are equipped with Magnetos have found it especially valuable, as it seems to be the only Plug on the market today that will withstand the combined ravages of the intense heat of the Magneto spark and the natural heat in the cylinder of a gasoline motor. It is a common occurrence for sets of these Plugs to remain unchanged in the cylinders over a year.

Made in all sizes and threads.

**DON'T BE CAUGHT EMPTY-HANDED, MR. DEALER!**

You can sell your customers Common Sense Plugs with the assurance that the SPLITDORF guarantee of Absolute Satisfaction is behind them.

Order a sample dozen today.




C. F. SPLITDORF

Walton Ave. and 138th St. Branch: 1679 Broadway

NEW YORK

## Main Office and Factory

261-3-5 Walton Avenue

Corner 138th Street

## New York

BRANCHES

NEW YORK: 1679 Broadway
CHICAGO: 319 Michigan Ave.
DETROIT: 968 Woodward Ave.
BOSTON Motor Mart
SAN FRANCISCO: 520 Van Ness Ave.
LONDON: 139 Long Acre
PARIS: 88 Avenue des Ternes
BRUSSELS: 33 Square Guttenberg
BARCELONA: 433 Consejo de Ciente
TURIN: 64 Via Santa Clara
JOHANNESBURG: 7 Simmonds St.

# Half a Million Dollars More to Clinch the Leadership of

THE Detroit ELECTRIC

We have recently invested half a million dollars more in adding to our already unequalled facilities.

This latest acquisition is the plant at Cleveland of the Elwell Parker Electric Company. Here will be built in future all the power plants for Detroit Electrics.

The importance of this to you, if you are a prospective buyer of an electric, will be instantly apparent.

Here is an electric carriage whose every moving part is in perfect operating harmony with every other, for the simple reason that each is manufactured with precise relation to every other.

It is impossible to secure perfect fit and perfect accord if motors are built here, gears there, frames elsewhere, and bodies at still another distant point.

The absorption of the Parker plant was the last step which makes this announcement possible.

No other maker produces, as we do, every part of his carriage — motors, gears, frame, body, upholstering.

In elegance, dignity and style, in luxury of appointment and upholstery—in mileage and speed and all the other attributes desired by the electric owner—the Detroit easily excels.

The Detroit was the only electric that attempted to cover the route of the Munsey tour, finishing without breakdown or repair and in perfect condition, over roads which racked the gas cars so severely that but one perfect score was made.

Write for the literature descriptive of the superb 1910 models.

*Established, Responsible and Energetic Dealers Wanted*

**Anderson Carriage Company, Station D, Detroit, Mich.**

# STOP! LOOK! LISTEN!

# MIDDLEBY

## Four-Cylinder
## 25 Horse Power
## Air-Cooled Motor

The MIDDLEBY cars, which have given such perfect satisfaction during the season of 1908-09, and cost less to maintain than cars at double their cost, are so much improved for 1910 in construction and finish that they will prove quick sellers and among the easiest running cars manufactured. ¶ Before purchasing or securing an agency, write for our catalogue describing our latest models:—

| | | | |
|---|---|---|---|
| Touring Car, - | $1250.00 | Single Rumble, | $1000.00 |
| Toy Tonneau, - | 1250.00 | Surrey Type, - | 1000.00 |
| Double Rumble, | 1100.00 | Runabout, - - | 850.00 |

*LIVE AGENTS WANTED*

## MIDDLEBY AUTO COMPANY

READING :: :: :: PENNA.

# DIETZ

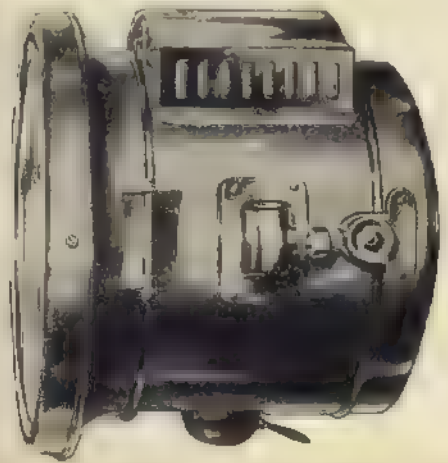
## THE TOP RUNG

of the ladder of success in the manufacture of Motor Car Lamps is shown in

## DIETZ LAMPS

We originated the first Cold Blast type of Motor Car Lamp which burns the brighter the faster the speed of the car, and years of improvement have made DIETZ Lamps well nigh mechanically perfect.

DIETZ Headlights for Acetylene Gas have also won an enviable place for handsome appearance and candle power efficiency.



Manufacturers, agents, jobbers and dealers, write for our Motor Car Lamp Catalogue and prices.

## R. E. Dietz Company

### 60 Laight St., New York City

Makers of Oil, Acetylene and Electric Car Lamps; "Handy" Generators

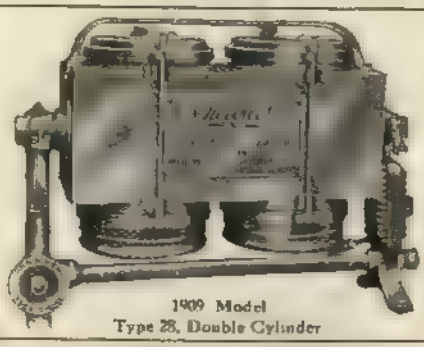
TRADE MARK

# The Neverout

TRADE MARK

## Patent Invertible System of Acetylene Gas Generation

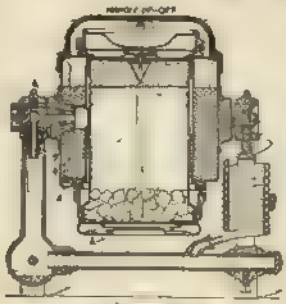
For Lighting Motor Cars and Boats



1909 Model
Type 28, Double Cylinder

Solves the Lighting Question for all time

Immediately Secured to Running Board of Auto—No Extras Required



Sectional View of Single Cylinder Type showing the contact broken between the dry carbide and the wet ashes—In the position OFF

### PATENT SYSTEM OF PURIFICATION

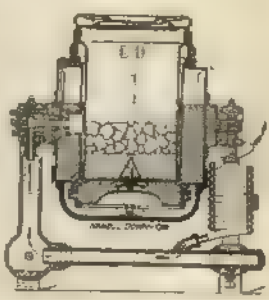
¶ The Neverout System has improved acetylene gas to such an extent as to almost double its lighting efficiency

¶ Note the patent system of purifying the acetylene gas which insures gas being delivered to the searchlight burners in uniform quantities and of the highest possible candle power

¶ This patent system of purifying the gas eliminates the moisture and other impurities thereby insuring the life of the burners indefinitely—a point of economy that cannot be overlooked

¶ It is used by the U. S. Government in the Panama Canal enterprise and by the most discriminating automobilists of the United States and Europe

¶ Guaranteed to be as represented or money back.



Sectional view of Single Cylinder Type showing contact renewed by "inverting"—In the position ON

¶ Write to-day for data, which will free you from troubles with the ordinary acetylene generator and the old fashioned gas tank

**ROSE MANUFACTURING CO., 911 Arch Street, Philadelphia, U. S. A.**

*Sole Manufacturers of the Celebrated Neverout Double Focus Searchlights*
*The Only Steady and Unwavering Searchlights*

# DIETZ "HANDY" GENERATORS

¶ The gas-generating capacity of Dietz "HANDY" Generators is amply sufficient for all the lights on a car, and if burned in one flame with an adequate burner tip, the generator gas would show a surprising candle power.

## FURTHER:

The "HANDY" Generators are simple — four parts only. Square and round models, 2 lb. and 3½ lb. carbide capacity.

**$8.50 and $12.50 List**

*Usual Trade Discounts*

We make an interchangeable burner for Acetylene gas in oil lamps, the DIETZ "Presto."

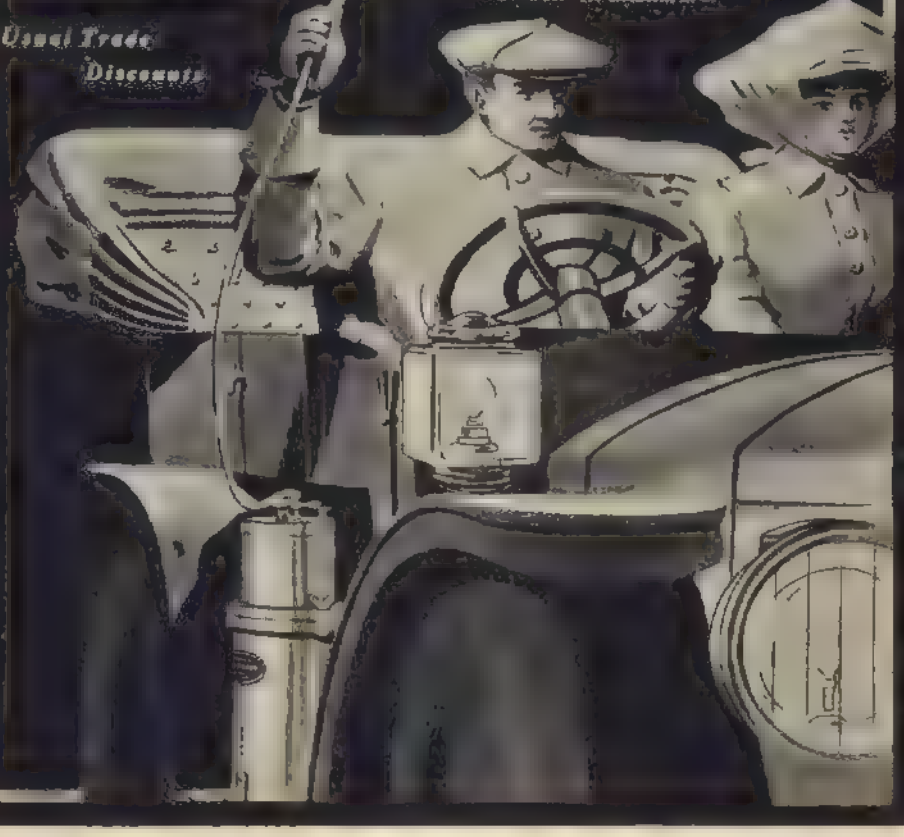
*Inquiries Solicited*

**R. E. Dietz Company**

**60 Laight Street, NEW YORK**

Established 1840

DETROIT—220 Woodward Avenue
LONDON—[illegible]



# DIETZ

## "Majestic" Searchlights

*"A good searchlight is a good reason"*

[illegible] ¶ The Dietz new model "Majestic" is made in 4 sizes of lenses, 5" to 9" dia., and has a sweeping radius of beam both horizontal and vertical. Well-made, handsome by daylight; in short, designed

FOR SUPERIOR CARS

[illegible]

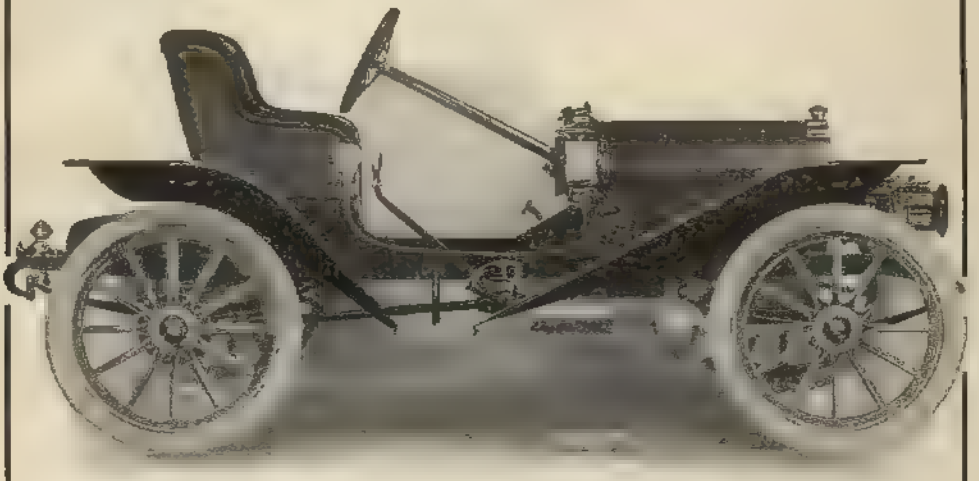
R. E. DIETZ COMPANY [illegible] LAIGHT STREET NEW YORK

[illegible] WOODWARD AVENUE, DETROIT [illegible] HOLBORN, E. C., LONDON

# HERE IT IS

# "DEMŌT"

All of the best features of the high-priced cars embodied in a runabout at a price within reach of all.

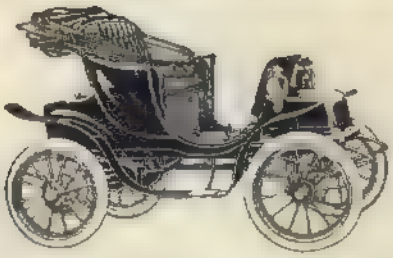


## $550—Magneto Included

*Write for Agency Proposition*

DEMOTCAR SALES CO.
Distributers
45 State Street
DETROIT :: MICHIGAN

**Demotcar Company**
Manufacturers
:: MICHIGAN



# The Perfect Electric Stanhope

Perfect in every department—as cozy and luxurious as any woman would have it—as able and efficient as any man would demand it to be.

Nothing is skimped in this car.

It is by far the handsomest stanhope on the market to-day.

Write for our catalogue describing mechanical features that will at once convince you that it's the soundest and strongest car of its kind in America.

*Agents in all principal cities*

## The Rauch & Lang Carriage Company

**Dept. D, 2180 W. 25th St., Cleveland, O.**

*Fifty-five years' experience building fine carriages*

# The Pitless Automobile Turntable

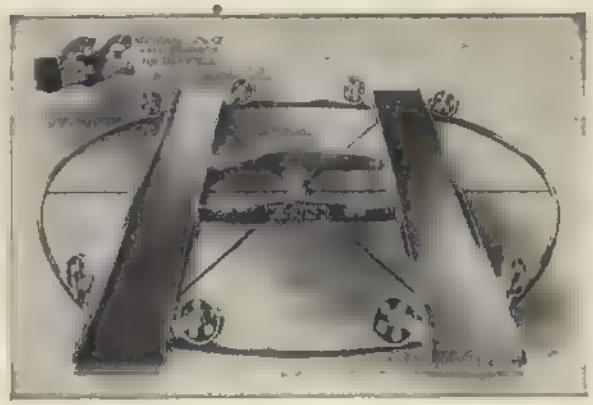
**INDESTRUCTIBLE**

Steel runways are supported by eight-inch machine faced wheels.

Bearings are of the regular Auto type, eliminating all friction.

Needs no oil.

Made in four sizes.



Steel runways weigh 33 lbs. per foot

Weight of largest turntable 1150 lbs. which will accommodate any car

Electric size weighs 800 lbs Its perfect construction makes it possible for a lady to turn her car with little effort.

**Fully Protected by Two U. S. Patents**

As a Washstand Turntable it has no equal.

**Manufactured by** **PITLESS TURNTABLE COMPANY**

**1333 Walnut Street, Kansas City, Missouri**

Every Taxicab Owner
Should Investigate The

# "Ever Ready"
# Taximeter

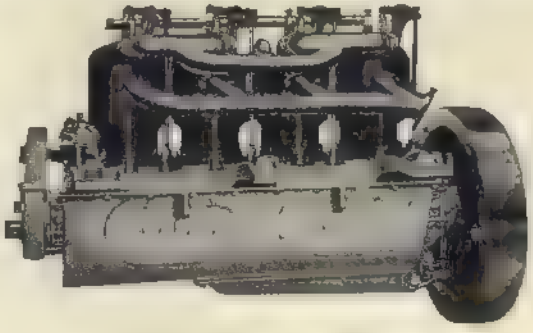
It is just what he has been waiting for. Without a single fault and with twice as many important features, it stands prominently superior to other meters.

**Illustrated Descriptive Catalog Now Ready**

**AUTO IMPROVEMENT CO.**
**304-322 Hudson Street**
**NEW YORK**

**755 Folsom St., San Francisco**

# BRENNAN STANDARD MOTORS



**Model "9" Vertical Motor**

Built in seven sizes of the four cylinder type and two sizes of the six cylinder type

It is light in weight, a thoroughout and powerful. All wearing parts are extra large, made of the very best of materials and finely finished

MODEL "9" is fitted for double ignition systems—by spark coil and magneto. It has a bracket and shaft for fitting magneto. The lubrication is by self-contained, force-feed oiling system

2 cylinder Motors, 4⅛ x 5, 5 x 5, 5½ x 5

**Brennan Standard Motors** were one of the first on the market. With each succeeding year they have been improved until they have no equal today. You make no mistake in using **Brennan Standards.**

We also make a specialty of Transmission Gears, Planetary and Selective Type Sliding.

Let us give you further particulars and quote prices.

**BRENNAN MOTOR MFG. CO., Syracuse, N. Y.**

# THE ALUMINUM CASTINGS CO.

GENERAL OFFICE
CLEVELAND, OHIO

PLANTS—Cleveland, Detroit, Buffalo, Syracuse and New Kensington

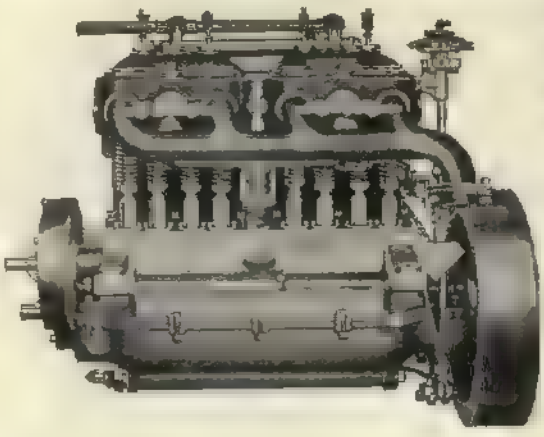
# High Grade Beaver Motors

**Work Like Beavers—Silent, Sure, Satisfactory**

6 Cylinder Vertical, 4¼ x 4½
4 Cylinder Vertical, 4½ x 4½ and 4½ x 5½
2 Cylinder Horizontal Opposed, 4½ x 4 and 4½ x 4 & 5½ x 4½
4 Cylinder Horizontal Opposed, 5½ x 4½

Centre Crank Oiling Device

All Motors are Four Cycle



The 4 Cylinder Horizontal Opposed Motor is Designed Specially for Commercial Trucks.

Write for FREE Booklet

**Beaver Mfg. Co., 783 Chase St., Milwaukee, Wis.**
(THE FILER-STOWELL CO., OWNERS)

# Chain Drives Save the Power Wasted by Gears

Any fair test between a chain and gear drive for doing the same work is bound to prove that the **rolling** of a chain into mesh with its sprockets absorbs less power than the **grinding** action of spur gear wheels. The difference in favor of the chain is even greater with bevel gears, for the latter require more bearings and waste still more power in end thrust. In other words, a car driven by **Diamond Chains** goes faster and farther with the same power than when gears are interposed. This, however, is only one point in favor of **Diamond Chain** drives. With our new detachable link a chain can be repaired on the road in a few minutes and for a few cents. When gears go wrong there is always a delay and a big repair bill.

Now that Diamond Chains are made with nickel steel rivets and chrome nickel steel side bars serious wear and elongation have been eliminated. The rivet bearing surfaces, as tempered by our exclusive process, are uniformly hard and durable so that a Diamond Chain may be depended upon for long life and satisfactory service.

Diamond Chains were the first American Automobile Chains and are still the best. Don't let dealers sell you a substitute. Write for a list of cars using Diamond Chains.

DIAMOND CHAIN & MFG. COMPANY

(Capacity 5,000,000 Ft. per Year)

260 W. Georgia St., Indianapolis, Ind.

# FAL

FOUND AT LAST

THE MOTOR CAR

FOR

ALL

LATITUDES

THE

# FAL-CAR

THE "CHICAGO MADE CAR"

4 CYLINDERS

30 HORSE POWER

TRIM, RELIABLE, CLASSY AND

FAST

AS

LIGHTNING

ROADSTER, TOURING CAR AND TOY TONNEAU NOW READY. TAXICABS FOR AUGUST DELIVERY.

PRICE, $1.650

FULLY EQUIPPED WITH MAGNETO AND SPEEDOMETER WRITE FOR CATALOG

FAL MOTOR COMPANY

15-21 NORTH MAY STREET

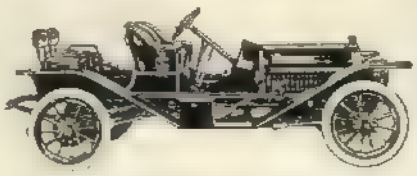
CHICAGO, ILLINOIS

# Speedwell

# $2,500

¶ Forty H. P., four-cylinder, completely equipped, including imported Bosch magneto. Top extra.

¶ BODIES—Touring car, baby tonneau and roadsters with either single rumble, double rumble or military rear seats.



## As An Agency Proposition

the Speedwell will appeal to the man who wants a big, powerful, efficient car—at a price that is not too high, yet high enough to insure the best of materials and construction in every detail.

¶ In the class where a car is sold on its own merits and not on a price basis alone, the Speedwell stands high.

¶ Get in touch with us now and receive the full benefits of our broad plans for 1910.

## The Speedwell Motor Car Co.

**DAYTON :: :: :: OHIO**

New York Office: 2002 Broadway, at 68th St.
Pittsburg: Speedwell Automobile Co., 5986 Center Ave.
Philadelphia: Standard Motor Car Co., 616 N. Broad St.
Milwaukee: Stephenson Motor Car Co.
Minneapolis: H. G. Goosman, 1023 First Ave. S.
Colorado Springs: Newbold & Co.
Chicago Office: 1455 Michigan Avenue, at 14th Street.
Denver: Taxicab & Motor Car Co., 1435 Cleveland Place.
Kansas City: Automobile Livery Co., 1113 Broadway.
Boston: Curtis Hawkins Co., Motor Mart.
San Francisco: Speedwell Motor Car Co. of California, 489 Golden Gate Ave.

# National

## Costly Construction

The improvements on the National from year to year constitute a very good history of motor car development. It has generally been somewhat in advance, but its departures have always soon become standard practice with the best manufacturers.

In the introduction of the all-ball-bearing motor, however, only a few of the highest priced cars—all costing much more than the National—have followed it. It is expensive construction, but no expense is spared at any point to make the National the best.

*Four Models—Fours and Sixes —from $2,750 to $5,000.*

**National Motor Vehicle Co.**
**1003 East 22nd St., Indianapolis, Ind.**

*Does*

THE FLYING MERKEL

# *Ball Bearing Motor have anything to do with this?*

¶ In the recent Atlanta, Ga., contests R. Walthour on a *Flying Merkel* won the 20-mile professional. He also won the 10-mile professional, making the fastest time in the event ever made on a motorcycle on a dirt track. Time, 8:36. Merkel riders also won three seconds at this meet.

¶ Out in Los Angeles, on the 7th of last month, this is what happened. Four miles for private owners, 30½ cubic inches won by Irwin Knappe, on a *Flying Merkel*. Time, 4:59⅘. Five miles amateur, free-for-all, singles—won by Charles Balke, on a *Flying Merkel*. Time, 4:28⅘. Four miles, professional open won by T M. Samuelson on a *Flying Merkel*. Time, 3:07.

¶ We have a catalog and Agency proposition ready — if you are.

## Merkel-Light Motor Company

**Pottstown, Pa.**

# THE GABRIEL HORN

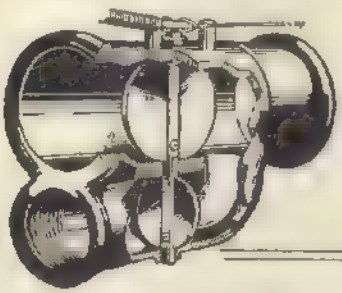
The 1910 model has all the valuable features which have made our Nos. 2, 3 and 4 horns so popular, the only change being that the two lower notes are operated together, making a perfect chord, while the high note, which is two octaves higher than bass chord, gives the effect of a soprano voice with a quartette.

## Trumpet Horn

Consists of four single tubes operated individually from keyboard for trumpet or bugle calls or operated in unison for signal purposes.

## Special Ten Tube Horn

Has full octave in key of G, with F sharp and A. Operated by a keyboard and all sorts of melodies can be played upon it. Built to order.



## 1910 Valve

Like 1909 model, except construction is changed so it forms practically one piece in strength clear through valve—lever is now made from ⅜" material. For cut-out purposes remove disc in main channel.

**GABRIEL HORN MFG. COMPANY**

1412 E. 40th Street, Cleveland, O. New York Branch, 1926 Broadway

---

ESTABLISHED 1844

# Schrader Universal Valves

Trade Mark Registered April 30, 1895

**SIMPLE AND ABSOLUTELY AIR TIGHT**

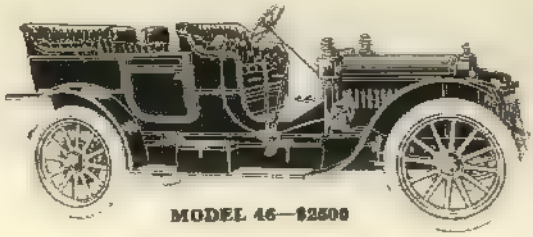
(Half Size)

Schrader Motor Tire Valves, as shown in cut, are the regular equipment for G & J style Motor Tires whether used on ordinary rims or demountable rims, such as Michelin or Continental Ready-Plated Tires, and are also used on Hartford Detachable, Fisk Detachable and New Goodyear Detachable Motor Tires.

Our No. 777 Motor Tire Valve is the standard for 2½" and 3" tires, and our No. 725 Motor Tire Valve is the standard for tires larger than 3".

Schrader Universal Valves as shown in cut and in different modifications, are used on all Bicycle Tires made in this country. These Valves are supplied to the trade by all Tire Manufacturers. Valve Parts can be obtained from the Tire Makers or from the Manufacturer.

**A. SCHRADER'S SON, Inc., 28-30-32 Rose St., New York City, N. Y.**



MODEL 46—$2500

The six cylinder car is the highest type of four cycle manufacture.

It is a vain attempt to minimize the inherent evils of the four cycle engine; which can only be escaped in the valveless two cycle Elmore.

It comes closer to the chief virtues of the Elmore valveless two cycle engine than any other.

It *tries* to give you continuous power—but what an appalling price you pay in complication and expense, without attaining the desired result!

In the 1910 Elmore catalogue, about to be issued, is an illustration which will make every four cycle owner stop and think.

It shows the Elmore engine in all its simplicity.

In contradistinction, it likewise shows the mass of trouble-making parts required to produce inferior results in the four cylinder engine.

In the Elmore four cylinder car—no valves, cams, springs, lifts or rollers. In the best six cylinder four cycle car—something like 150 parts, all adding their little quota to the cost of repair and upkeep.

In the valveless Elmore—absolute certainty and peace of mind—not a trouble to vex the owner from year to year; not a part to replace or repair.

In the other—the same uncertainty in principle and in operation, whether the cylinders be two, four or six; whether the price be high or low; the workmanship superfine or inferior.

Every Elmore dealer stands ready to prove to you that the 1910 Elmore represents:—

The valveless two cycle engine brought to a state of perfection that stamps the best four cycle engine a mechanical makeshift.

The simplest engine in the world beyond peradventure—the simplest, and by natural sequence, the smoothest and the most inexpensive.

Mark this prediction:—Investigate by demonstration the two new 1910 Elmore models and you will be forced by sheer weight of evidence to select one or the other in preference to any four cycle car made.

# Elmore

**Model 46, 1910 Elmore, $2,500**
(4 cylinders 46 H. P., 60 miles an hour)

**Model 36, 1910 Elmore, $1,750**
(4 cylinders, 36 H. P., 50 miles an hour)

**THE ELMORE MFG. CO., 904 Amanda St., Clyde, Ohio**

Member Association of Licensed Automobile Manufacturers

# BARGAINS

If you have not sent your name in for our big accessory catalog you have missed a good thing and lost $ $.

About half the riders in America buy parts from us because all are guaranteed and the prices are the lowest. We have the largest accessory stock in America. Send postal to-day for catalog A.

MOTORCYCLE EQUIPMENT CO.
Hammondsport, N. Y.

# GEER MOTORCYCLES

5-H.P. 2-cylinder GEER Model 5 $225 00
4-H. P. BLUEBIRD - - - 200 00
2½-H. P. GEER Model 4 150 00
Used motor-cycles - - - 40.00

We have the largest line of new and used motorcycles in the country at the lowest prices. Every machine guaranteed. Repairs a specialty. Motors and castings for air-ships. Motors for railway velocipedes. Send for catalogue.

HARRY R. GEER CO.
856 McLaran Ave. St Louis, Mo.

# "Wouldn't Take a *Thousand Dollars* For His Curtiss Motorcycle"

Altoona Pa., May 28, 1909.
Herring-Curtiss Company
Hammondsport, N. Y.
Gentlemen:

Machine arrived in fine condition. I have had three different makes in my time and must say that your machine for Power, Speed, Hill Climbing and Easy Steering can never be beaten. I am more than pleased with this little steed of steel and would not take *One Thousand Dollars* for it to-day, if I couldn't get another one.

Thanking you for your prompt and courteous attention given my order, I am

Yours very truly,
A. V. CONRAD

This is but one of hundreds of similar unsolicited testimonials received from Curtiss riders.

Every Curtiss motorcycle is just as good as this one.

Write for Agency Proposal to-day.

HERRING-CURTISS COMPANY
Hammondsport :: New York

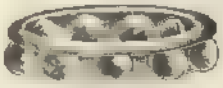
New York Distributor
CURTISS MOTORCYCLE COMPANY
1203 Bedford Ave., Brooklyn, N. Y.

Pacific Coast Distributor:
G. A. FAULKNER
351 12th Street Oakland, Cal.

# THE STAR BALL RETAINER CO.

Lancaster, Pa., U.S.A.

Complete Thrust Bearing



Radial Retainers

Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings, Special Stamping, etc.

# Torpedo Motorcycles

WHY HESITATE? Unless you ride the BEST you cannot be a SATISFIED MOTORCYCLIST. You know there can be but one BEST and that is the TORPEDO. Write for catalog and agent's terms.

The Hornecker Motor Mfg. Company
Geneseo, Ill., U. S. A.

THE "KENO CONNECTION"

is the best pump nipple ever made. One sample for 15c.

Stevens & Co.
376 Broadway, New York City, N. Y.

# Motorcycle Accessories

Send for largest and most complete catalogue ever issued. **Indian & Harley-Davidson Motorcycles, $50 Up.**

F. B. Widmayer Company, 2312 Broadway New York City

# SPROCKETS

for Bicycle and Motorcycle

WE MAKE 90 PER CENT OF THE SPROCKETS USED

THE PARISH & BINGHAM CO.
Cleveland, Ohio

AGAIN THE PERFECTED

# Great Chadwick Six

## IS VICTORIOUS

¶ In the Fairmount Park 302½ mile race, the Great Chadwick Six made the fastest lap recorded for the course. The distance per lap was 8.1 miles and the time was 7 minutes, 41 seconds, an average of 63.4 miles per hour, over one of the most difficult courses upon which a long road race has ever been held.

¶ The CHADWICK car also finished fourth, although handicapped before going twenty-five miles, by having three of the spokes of the rear wheel broken as a result of having been hit by a contesting car. This mishap made it necessary to take all curves at a slow rate.

¶ The performance of the GREAT CHADWICK SIX in this contest demonstrates that it is the fastest stock car in the world, that it can be depended upon to go great distance at a high rate of speed. If you are looking for the BEST, and a car of EXCLUSIVENESS, send for our new catalogue describing our 1910 models.

## Chadwick Engineering Works

POTTSTOWN, PA.

# The VERDICT of COMPETENT JUDGES

*to wit:*—the leading mechanical engineers—is that

## KEYSTONE GREASE

IS

## "The World's Greatest Lubricant"

This advertisement is your guarantee of protection. Under the classification of lubricant are sold many kinds of good, bad and awful compounds, and the average man runs a chance of buying a lubricant which will do more harm than good.

Those greases which contain animal and vegetable oils become rancid and form an acid which eats the surface of your bearings and gears. **Keystone Grease** is entirely petroleum in its make-up, and will not harm any metal.

Most greases are either too thin in summer or too thick in winter. **Keystone Grease** is always the same, as it is not changed by climatic conditions.

## Keystone Lubricating Co.

EXECUTIVE OFFICES AND WORKS:

20th St. and Allegheny Ave., Philadelphia, Pa. Chicago Address, Tacoma Building.
New York Office (Automobile Dept.): 1777 Broadway. Boston Address, Oliver Building.
New Orleans Address: 610-612 Chartres St.

WE HAVE NO CONNECTION WITH THE OIL TRUST

# AGAIN THE PERFECTED

# Great Chadwick Six

# IS VICTORIOUS

¶ At Indianapolis, Ind., on August 19th, it won the ten-mile free-for-all, defeating the 120 H. P. specially built Benz Racing Car, the Fiat, the six-cylinder National, and a most representative field. Time, 8 minutes, 23 seconds, which is the new world's record for a ten-mile track race.

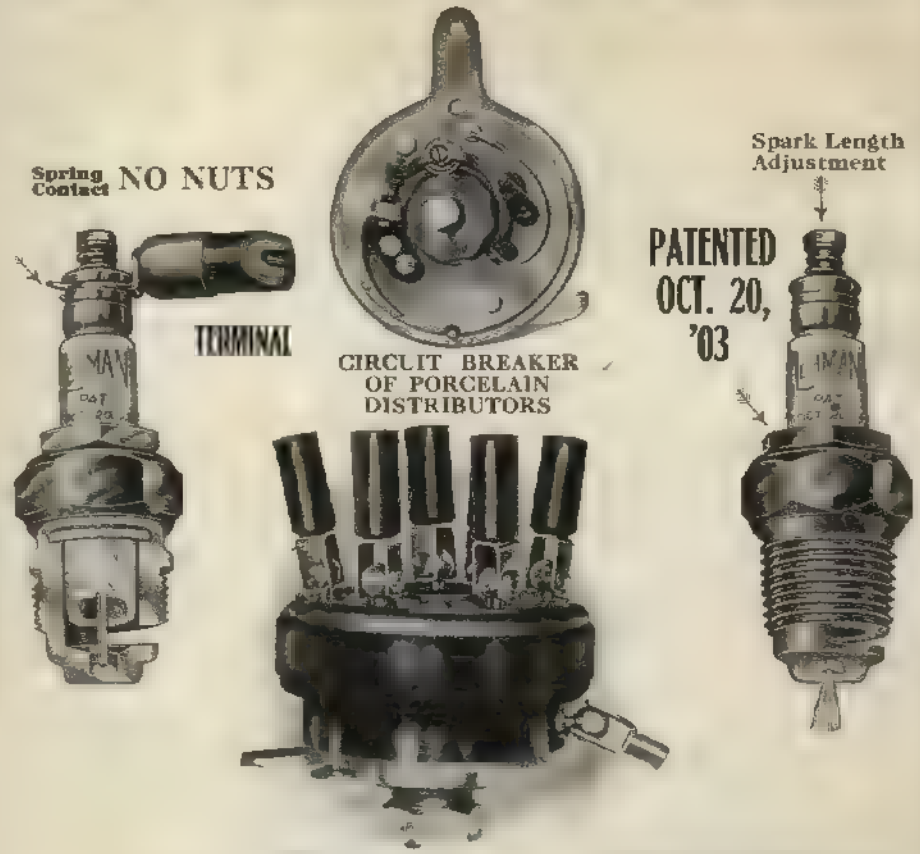
¶ Remember this record was made with a stock car, as were all the other victories of the PERFECTED GREAT CHADWICK SIX. The term "stock car" is often misleading and is used by many makers who build special racing machines for themselves and different cars for the public. We will sell anyone the car which wins the race or its exact duplicate at our catalog price, for it is our standard runabout and is identical with the cars sold to the public.

## Chadwick Engineering Works

POTTSTOWN, PA.

# THE LEHMAN LINE FOR 1910

## High Grade Ignition Apparatus



Sole Agents for North and South America

Berliner Kugellager Fabrik
BERLIN, GERMANY
Annular Ball Bearings

Sole Agents for North and South America

C. & E. FEIN
STUTTGART, GERMANY
"Fulmina" High Tension Magnetos

**J. H. LEHMAN MFG. CO., Inc., 29 West 42d Street, New York**

**Manufacturers of Electric Ignition Apparatus for Explosive Engines**

THE PERFECTED

# Great Chadwick Six

## A Different and a Better Car

Will go faster or slower on the high gear than any large stock car in the world, because of perfect engine control.

**Touring Cars, Guy Vaughn and Standard Tourabouts $5,500**

THE PERFECTED GREAT CHADWICK SIX RUNABOUT

Speed, 80 miles per hour. Weight, 3,000 lbs. Price, $4,500.

## Chadwick Engineering Works

POTTSTOWN, PA.

Our new catalog will be ready for mailing within a few days. Send for a copy.

**35-P.**
**Torpedo**
**Tonneau**

**Price,**
**$2250**
**(Magneto Included)**

The Southern Bell Telephone Co., with headquarters in Atlanta, Ga., wanted a good, reliable car. The best, for their requirements, could be none too good, for they would exact a great deal of it and test its endurance to the utmost. They did not wish to make any mistake. They carefully considered many cars of well-known makes, in fact all of the leading and best cars in the country, and were offered all sorts of inducements in the way of concessions, etc., but were so impressed with the merits of the Selden car that in the end they made it their choice and paid the full retail price for a Model 35 Touring Car. The New York Herald-Atlanta Journal endurance run about this time appealed strongly to President Gentry of the Southern Bell Telephone Co., as something likely to furnish the best possible means of testing the staying qualities of the car he had chosen. Special representatives of the Southern Bell Telephone Co., Messrs. John C. Wheatley and Evelyn Harris (the latter a son of the late Joel Chandler Harris, "Uncle Remus"), were sent to New York and the entry was made in Mr. Harris' name. Henry R. Selden and Jack Harrigan completed the party of four who were to occupy the car on its long and gruelling tour. Through the courtesy of the Bell Telephone Co., extended by Messrs. Wheatley and Harris, the tourists were permitted to enjoy free long-distance telephone service, nightly, at each stopping place along the route. It was a hard journey, which put many of the best-known cars out of commission, and heavily penalized others, but the Selden car made a perfect score, as is shown by the following telegram from Mr. Evelyn Harris at the finish, proving beyond the peradventure of a doubt the sturdiness, the power and strength, and the sterling worth claimed for the **Selden** car by its makers.

**7.30 P. M.** **Atlanta, Ga., Nov. 3, 1909.**

**"Checked in with perfect score; car in fine condition; all well; congratulations."**

# SELDEN MOTOR VEHICLE CO.

**GEORGE B. SELDEN, President**

## ROCHESTER, N. Y.

**Members of the Association of Licensed Automobile Manufacturers**

**Licensed under Selden Patent**

# THE PERFECTED
# Great Chadwick Six

## The Perfected Great Chadwick Six
## STOCK RUNABOUT

defeated all American cars and the Famous Fiat Cyclone as well, up "Giant's Despair" Mountain, Wilkes-Barre, on Memorial Day, breaking its own 1906 record by three seconds and being only four seconds slower than the 125 H. P. Benz Racing Car.

¶ THE PERFECTED GREAT CHADWICK SIX RUNABOUT which made this wonderful record,—or its exact duplicate,—may be purchased at the regular catalog price,—$6500. Speed, 90 miles per hour. Weight, 3000 pounds.

## TOURING CARS
## TOURABOUTS
## RUNABOUTS

## Chadwick Engineering Works
## POTTSTOWN PENNSYLVANIA

Half the work of selling most cars, Mr. Dealer, as you know, consists of overcoming the purchaser's preference, or prejudice in favor of some other car.

## Easy to Sell

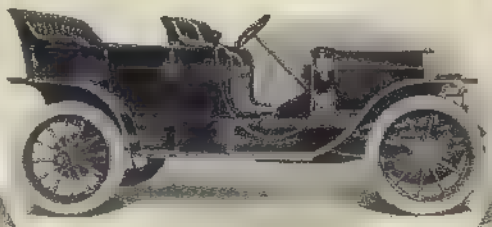
The Great Western "30" is an easily sold car for various reasons. These reasons form a basis of argument that overcomes all previous prejudice which may exist in the mind of the prospective purchaser. The price the power, the light weight, the appearance, the equipment, the absence of cast iron, the inclusion of a magneto — are points which sell the "30."

The light weight of the Great Western "30" in proportion to its horse power is an argument which can be exploited in a dozen ways. It has a direct bearing on tire economy, on upkeep, on repairs, on reserve power, on hill climbing, on brake action, -in fact, on the action of every feature of the car. The five-bearing crank shaft, with 14½ inches of bearing, is a point that can be made against any other car, regardless of price.

## Light Weight

# Great Western

IT NEVER LAYS DOWN



# $1600

Drop frame, 34-inch wheels, drop forged front axle, special steel, I-beam with spring, seats forged integral with the axle,—these are points which make the sale of a Great Western "30" a simple matter. It is an axiom among builders of explosive motors that in long stroke motors the greatest power is developed. The Great Western motor cylinders, 4¼ x 5, give a power unequaled by any other automobile engine known.

## Talking Points

We want you to read the specifications and write us for open territory. Today now — while you are thinking of it is the best time to connect with the best automobile proposition ever offered a dealer. Don't forget the price—$1600.

HORSE POWER—30, four cylinder, four cycle water cooled, two-bearing crank shaft of ample proportions, 4¼ in bore, 5 inch stroke. TRANSMISSION—Sliding gear selective type, three speeds forward and one reverse. SHAFT—Open end tubular housing. CLUTCH—Cone type. Lined with a composition face that insures smoothness and efficiency. REAR AXLE—Semi-floating type of ample proportions. FRONT AXLE—Drop forged I beam section, special steel in a single piece with hubs and spring seats forged integral. FRAME—Pressed steel with sub frame, narrower in front to permit of short turning. WHEEL BASE—120 inches. TREAD—56 inches. WHEELS—34 x 3½ artillery type, large spokes, quick detachable rims. FRONT SPRINGS—52 inches, semi-elliptic. REAR SPRINGS—54 inches, three quarter scroll elliptic. BRAKES—Two separate and distinct, one internal expanding, the other external contracting, operating on pressed steel drum large and efficient. Body—Five passenger with plenty of room in the front and divided front seats. COLOR—Deep coach blue with cream running gear, elegantly finished and upholstered. GASOLINE CAPACITY—20 gallons.

## Specifications

## Great Western "30"

**Great Western Automobile Co.**
**PERU, IND.**

# A Limitless Field For Dealers

To up-to-date, energetic dealers, the Sireno Electric Horn offers magnificent opportunities—a sale for every automobile in use.

For every motorist wants the Sireno Horn—the horn that clears the road for a mile ahead. With the Sireno on his car, he can drive as fast as he likes. No slowing down at crossings and turns—no emergency stops.

For a touch on a button conveniently placed—and the Sireno hurls a powerful, piercing, yet musical note a mile ahead a signal that effectually clears the road.

## The SirenO

***The "Mile-Ahead" Horn***

is a marvel of simplicity. No Diaphragm to crack nothing to wear—nothing to adjust. It is simply a tremendously efficient electric fan, operating on the siren principle—much like the far-reaching, unfailing signals used on the ocean liners.

## Always Ready For Use

The Sireno is the most dependable horn made. Starts the minute you close the switch—stops as quickly.

Electrically operated by the ignition battery—or any 6 or 8-volt battery, if the car has a magneto. Entirely independent of the engine.

And so flexible that you can get a note of any intensity. Weighs but 6 pounds—easily installed and needs positively no attention.

## The Horn For Every Car

To-day there are thousands of Sireno Horns in use. Yet the field is practically limitless.

The Sireno itself is designed and finished to be in keeping with the fittings of the finest cars. And the Sireno Junior is adapted for runabouts and light touring cars. So you can sell a horn for every car sold.

**Write to-day for the details of our plan to help our dealers—for the facts about our advertising campaign to tell motorists of the merits of the Sireno. Write to-day—let us tell you more of the horn that every motorist wants—the horn that means a stream of extra profits—and big ones, too.**

**The Sireno Company, 1150-1152 Taylor Bldg., New York**

# GREYHOUND

# MOTORCYCLE

¶ The simplest and most comfortable machine of its class in the whole wide world.

¶ Strong, speedy, silent and satisfactory.

¶ Many distinctive features of unquestioned value.

¶ **The Greyhound Shock Absorber** is the best and most valuable comfort device ever used on a motorcycle.

¶ Split crank case—One piece forged steel crank shaft—Internal control—Perfect spring fork—Long wheel base.

¶ Correspondence wanted with dealers and riders.

¶ Catalogue for the asking.

**The Auto-Bi Company**

Subsidiary American Motors

**1453 Niagara St., Buffalo, N. Y.**

**SALES AGENTS:**

**Metropolitan District:** The Brown-Dewey Company, 1697 Broadway (53rd St.), New York. **Chicago District:** Whipple, "The Motorcycle Man," 260 W. Jackson Blvd., Chicago, Ills.

## Don't Guess Which Motorcycle to Buy!

## Investigate Thoroughly and Find Out

WHY Roller Bearings are better than bronze

WHY the Curtiss "V" Belt Transmission with 4 years of experience behind it is the best in the world

WHY the Curtiss Frame and Fork Construction has proven superior to all other types

WHY a 4 horse engine has a more powerful speed for the same cubic capacity than any other engine in the world

WHY we won the only Diamond Medal awarded in the 1907 F. A. M. Endurance Run

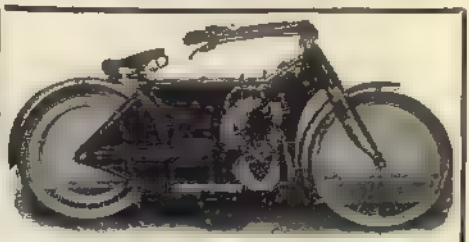
WHY we won the World's Championship and many other awards

The way to find out is to send for a catalog [illegible] the famous "Wonderful Reliable" Motorcycles. Most [illegible] offered [illegible] riders, 5 to 10 horse-power [illegible] Delivery Vans, etc. Some good territory [illegible] Write today

**THE HERRING-CURTISS CO., Hammondsport, N. Y.**

Successors to The G. H. Curtiss Mfg. Co.

New York Distributors, Curtiss Motorcycle Co., 128 Bo[illegible] Ave., Brooklyn, N. Y. Pacific Coast Distributor, J. A. Frank[illegible] 351 24th St., Oakland, Cal.



# MIDGET BI-CAR

The most comfortable Motorcycle produced. Built like a car. Agents better hear our proposition before closing contracts.

**Walton Motor Co. (Inc.)**

**Lynbrook, Long Island**

**Sole Licensees and Manufacturers**

20th Century

MOTOR-CYCLE SEARCHLIGHTS

Wagon Lens Reflectors up 18 front glass. Send for our list of Motor Cycles and the Brackets each one will hold.

First in Style and Quality. First in the hearts of the Motorcyclists.

Lamp No. 102
Bracket No. 142

GAS BICYCLE HEADLIGHT
Also have Separate Generator Bicycle Lamps

Automobile and Boat Lamps
20th Century Mfg. Co., 19 Warren St., N. Y.

GET THIS BIG MOTORCYCLE BOOK FREE

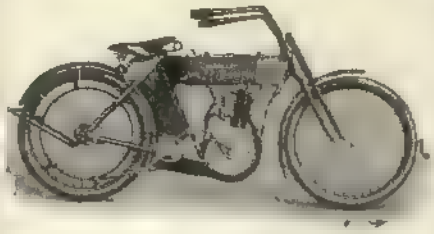
It contains much valuable information that you should have. If you intend to buy a Motorcycle or Motor or if you have a Motorcycle and want prices on Accessories you should not miss this opportunity to get this FREE book of Useful Information.

Send Stamp today to

Motorcycle Equipment Co. Hammondsport N. Y.

Winner of the Only Diamond Medal, 1908

F. A. M. Endurance Run



The 1909 Harley-Davidson

better than ever

SEND FOR CATALOGUE

HARLEY-DAVIDSON MOTOR COMPANY
MILWAUKEE

MERKEL-LIGHT

BELT AND CHAIN-DRIVEN

MOTORCYCLES

have more exclusive meritorious features than any other motorcycle on the market—a strong statement, but substantiated by facts. Get our catalog for details about the **Merkel Ball Bearing Motor, Spring Frame and Fork**, automatic mechanical force feed lubricator; leverless and jointless handle-bar control, etc.

It's free for the asking.

MERKEL-LIGHT MOTOR COMPANY, Pottstown, Pa.

Motorcycle Accessories

Send for largest and most complete catalogue ever issued. **Indian & Harley-Davidson Motorcycles, $50 Up.**

F. B. Widmayer Company, 2312 Broadway New York City

F. A. BAKER & CO.

MOTORCYCLE SUPPLIES

SEND FOR CATALOGUE

87 Warren St., New York

SPROCKETS

for Bicycle and Motorcycle

WE MAKE 90 PER CENT OF THE SPROCKETS USED

THE PARISH & BINGHAM CO.
Cleveland, Ohio

THE "KENO CONNECTION"

is the best pump nipple ever made. One sample for 15c.

Stevens & Co.

89 Chambers St., New York City, N. Y.

Torpedo Motorcycles

WHY HESITATE? Unless you ride the BEST you cannot be a SATISFIED MOTORCYCLIST. You know there can be but one BEST and that is the TORPEDO. Write for catalog and agent's terms

The Hornecker Motor Mfg. Company
Geneseo, Ill., U. S. A.

cold, but the oil gets too thin and does not pack when the engine gets hot. I have had users say they got a third more power by using a heavy high fire test oil The strength of the spring must be according to the weight of the valve and its lift. I believe in short lifts, large valves, light weights and light springs. The light spring lets in the new charge easily, but if the valve is so heavy as to be slow in action the charge gets out again. The light valve is doubly valuable because it can lift easily and close easily. Your engine has probably lost compression. This will cut down the speed and power. A high compression suffers more from a leak than does a low compression engine. —C. E. D.

### IS SHAFT DRIVE PRACTICABLE?

[511] I would greatly like to hear your discussion on the shaft drive as applied to motorcycle. Your opinion on the questions below will be appreciated.

Is the shaft drive as applied to motorcycles practicable on Thor type of motor? Do you believe the cost of manufacture to be one of the reasons that it is not more widely used on American machines? Do you not think that it would be a success if it were applied on such machines as the Indian, R. S., or Thor?

NEW YORK. S BUSCH

We see no reason why a shaft drive cannot be used with the Thor type of motor, but this would probably necessitate changes in the crank case and crank shaft design. The shaft drive is perfectly practical as has already been demonstrated by both foreign and American-made machines.

The cost of manufacture is undoubtedly one reason why the shaft drive has not been more often used, but the irregularity of the impulses given by a single cylinder motor is another reason why the shaft drive has not been more extensively used. With a multi-cylinder engine the torque is more uniform. With a single cylinder engine some form of friction or spring absorbing device should be placed between the engine and the shaft.

### WANTS TWO-CYCLE WATER-COOLED MOTORCYCLE

[529] Am contemplating building a two-cycle water-cooled motorcycle and would like to ask of you which would be the better plan, to have the flywheel inclosed in the crank case, or on the outside?

(a) Would a 3⅛x3½-inch motor be large enough, and approximately how much H P. would an engine of this bore and stroke develop?

(b) By mixing lubricating oil with gasoline, does it lubricate the entire engine, even the crankshaft bearings, or would it be necessary to have compression cups for these bearings?

(c) In the syphon principle of water cooling, does the cylinder have to be below the lowest point of the radiator?

(d) Do you know of any engine builders who make an engine such as I want?

HUNTINGHURG IND. C. M. DOWELL.

(a) A single cylinder 3⅛x3½ 2-cycle ought to develop at least 6 H. P. and would be ample for any motorcycle.

(b) Placing lubricating oil in gasoline tank lubricates all of the motor that the mixture reaches, including crankshaft bearings

(c) There is no "siphon" action in water cooling without a water pump. "Thermal circulation" is the term. The bottom of the radiator water should be at least an inch below the bottom of the cylinder water jackets, car standing level.

(d) Motorcycle Equipment & Supply Co, Hammondsport, N. Y.—H. D.

THE STOCK MACHINE IS THE MOTORCYCLE THAT COUNTS, and the

**HARLEY-DAVIDSON**

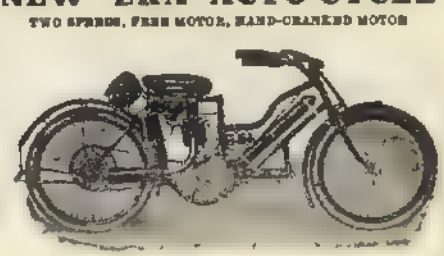
has conclusively proved that it is without an equal in this class.

**Some Recent Stock Machine Victories:**

Milwaukee, Wisconsin, September 25th
Fort Collins, Colorado September 29th.
Marion, Kansas, September 30th
Milwaukee, Wisconsin, October 2nd.
} WON EVERY RACE ENTERED

**HARLEY - DAVIDSON MOTOR COMPANY**
MILWAUKEE, WIS.

**NEW ERA AUTO-CYCLE**
TWO SPEEDS, FREE MOTOR, HAND-CRANKED MOTOR



**The New Era Gas Engine Company**
7 Dale Avenue, Dayton, Ohio

THE STOCK MACHINE IS THE MOTORCYCLE THAT COUNTS, and the

**HARLEY-DAVIDSON**

has conclusively proved that it is without an equal in this class.

**Some Recent Stock Machine Victories:**

Milwaukee, Wisconsin, September 25th
Fort Collins, Colorado, September 29th
Horton, Kansas, September 30th
Milwaukee, Wisconsin, October 2nd.
} WON EVERY RACE ENTERED

**HARLEY - DAVIDSON MOTOR COMPANY**
MILWAUKEE, WIS.

**"Wouldn't Take a *Thousand Dollars* For His Curtiss Motorcycle"**

Altoona, Pa., May 18, 1909.
Herring-Curtiss Company,
Hammondsport, N. Y.

Gentlemen:

Machine arrived in fine condition. I have had three different makes in my time and must say that your machine for Power Speed Hill Climbing and Easy Starting can never be beaten. I am more than pleased with this little steed of steel and would not take *One Thousand Dollars* for it to-day, if I couldn't get another one.

Thanking you for your prompt and courteous attention given my order, I am,

Yours very truly
A. M. CONRAD.

This is but one of hundreds of similar unsolicited testimonials received from Curtiss riders.

Every Curtiss motorcycle is just as good as this one.

Write for Agency Proposal to-day.

**HERRING-CURTISS COMPANY**
**Hammondsport :: New York**

New York Distributor.
**CURTISS MOTORCYCLE COMPANY**
**1203 Bedford Ave., Brooklyn, N. Y**

Pacific Coast Distributor:
**G. A. FAULKNER**
**351 12th Street Oakland, Cal.**

**N. S. U.** MOTORCYCLES DELIVERY VANS SIDE & FORE CARS

With an N. S. U. you can put all thoughts of roadside troubles to one side—they never occur. You need have no fear of heavy running expenses. You have a motorcycle which has earned a world-wide reputation for reliability, efficiency and strength. You can buy no better at any price.

THE DEALER, THE RIDER, GET CATALOGUE "A"

**N. S. U. MOTOR CO., 206 West 76th St., New York City**

**YOU SEE THEM EVERYWHERE**

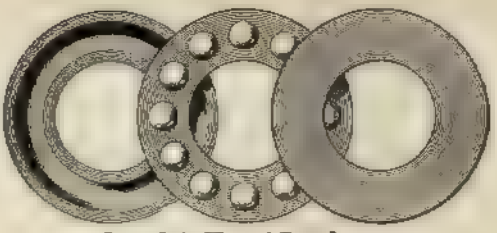
**The Eclipse Coaster Brake**

is the equipment on the majority of bicycles and motorcycles, because it is simple, highly efficient and satisfactory. Are your 1910 machines so equipped? If not, better get particulars and prices.

**Eclipse Machine Company, Elmira, New York**

**THE STAR BALL RETAINER CO.**

Lancaster, Pa., U.S.A.



Complete Thrust Bearing

Radial Retainers

**Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings, Special Stamping, etc.**

# BARGAINS

If you have not sent your name in for our big accessory catalog you have missed a good thing and lost $ $.

About half the riders in America buy parts from us because all are guaranteed and the prices are the lowest. We have the largest accessory stock in America. Send postal to-day for catalog A.

MOTORCYCLE EQUIPMENT CO.
Hammondsport, N. Y.

## NEW ERA AUTO-CYCLE

TWO SPEEDS, FREE MOTOR, HAND-CRANKED MOTOR

**The New Era Gas Engine Company**
7 Dale Avenue, Dayton, Ohio

## Have You Seen the

MOTOR CYCLE MOTOR BOAT &
**AUTOMOBILE TRADE DIRECTORY**
(Published in Philadelphia)

It is worth more than other directories which cost five times as much

Sample copies sent free on request to anyone in the automobile industry.

Single copies - 50c.
1 year - - $1.00 5 years - - $4.00

CHILTON PRINTING CO.
Market and 49th Sts., Phila., Pa.

## GEER MOTORCYCLES

5-H.P. 2-cylinder GEER Model 6 $225.00
4-H. P. BLUEBIRD - - - 200.00
2½-H. P. GEER Model 4 150.00
Steel auto-cycle - - - 40.00

We have the largest line of new and used motorcycles in the country at the lowest prices. Every machine guaranteed. Repairs a specialty. Motors and seatings for air-ships. Motors for railway velocipedes. Send for catalogue.

HARRY R. GEER CO.
856 McLaran Ave. St. Louis, Mo.

## Torpedo Motorcycles

WHY HESITATE? Unless you ride the BEST you cannot be a SATISFIED MOTORCYCLIST You know there can be but one BEST and that is the TORPEDO. Write for catalog and agent's terms

The Hornecker Motor Mfg. Company
Geneseo, Ill., U. S. A.

## Motorcycle Accessories

Send for largest and most complete catalogue ever issued. **Indian & Harley-Davidson Motorcycles, $50 Up.**

F. B. Widmayer Company, 2312 Broadway New York City

THE "KENO CONNECTION"
is the best pump nipple ever made. One sample for 15c.

Stevens & Co.
375 Broadway, New York City, N. Y.

## SPROCKETS
for Bicycle and Motorcycle

THE PARISH & BINGHAM CO.
Cleveland, Ohio

# The Houpt Car

**4 cylinder, 60 horsepower, costing $5000, is now ready for delivery**
**6 cylinder, 90 horsepower, costing $6000, will be ready in October**

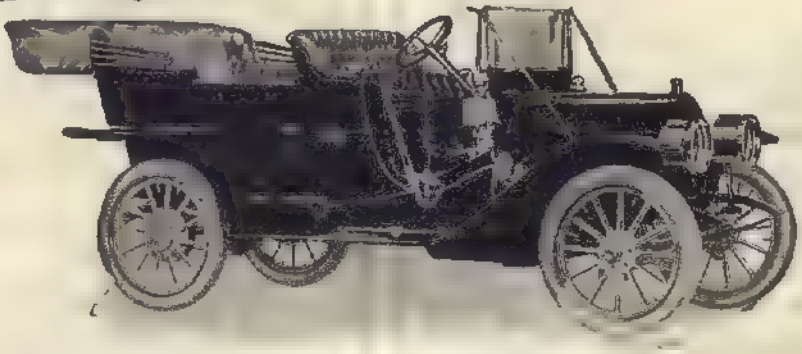
The Houpt car represents five years' persistent experimentation and combines the experience of two decades in the development of motor cars. It is the highest expression of automobile engineering, the final word in motor car construction.

## Harry S. Houpt Mfg. Co.

BRISTOL, CONN. 68th & Broadway, N. Y. CITY

Now prepared to assign territorial rights throughout the United States

# Dorris Model E, 1910

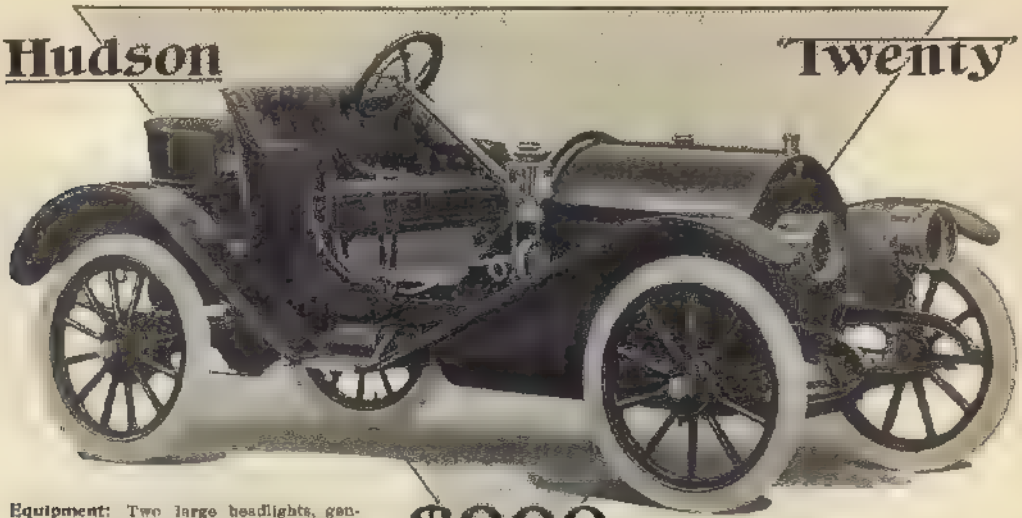


## $2500, Fully Equipped with

Top and Dust Cover
Speedometer
Five Lamps
Tire Carrier
Prest-O-Lite Tank
Tools
All Brass Folding Wind Shield

DORRIS MOTOR CAR COMPANY, ST. LOUIS, MISSOURI

# Hudson "Twenty"



**Equipment:** Two large headlights, generator, two side oil lamps, tail lamps, full set tools and horn $900.
With Bosch magneto, top, Prest-O-Lite tank, double rumble seat—$1050

**$900**

*"Look for the triangle on the Radiator."*

# Strong—Speedy—Roomy—Stylish

**There have been many low priced cars, but never one so big, strong, speedy and good looking as this one. In this car you find that something called *class*—that something which other cars at or near this price have lacked.**

The officers of the Hudson "Twenty" have been the first to appreciate that it is as easy to make a good looking car and sell it for less than $1,000 as it is to make the other kind.

Most low priced cars have been too small. In the Hudson "Twenty" you get a *big* car with a 100 inch wheel base, and 32 inch wheels. It is as roomy as any roadster made, regardless of price. To insure absolute comfort to the driver and passenger, the foot pedals are adjustable. A woman can drive it with as much comfort as a 6-foot man.

## Some High Grade Features of this 1910 Model

### *Sliding Gear Transmission*

It has a sliding gear transmission, selective type, three speeds forward and reverse, such as you find on the Packard, Peerless and other high grade cars

Its motor is the Renault type, patterned after the famous French motors of that name.

### *Long Stroke Motor*

With a bore of $3^3/_4$" and a stroke of $4^1/_2$" it conforms to the most up-to-date foreign design, a long stroke motor.

The front axle is a one piece drop forged I-beam section of the best grade of open hearth steel carefully heat treated.

### *Three-quarter Elliptic Springs*

The judgment of the best designers in the world is back of the suspension of the Hudson "Twenty." Semi-elliptic in front, and three-quarter elliptic rear springs are the easiest riding under all conditions, faster and due to their peculiar actions, are the least liable to fracture. This is the spring suspension found on the Hudson "Twenty." Springs are unusually long, and mounted with heavier and stronger fittings than on many cars twice the weight

### *Carbureter Specially Designed*

The carbureter has been especially designed for the motor, insuring absolute control at all speeds

The fan, as in the best high-priced cars is belt driven and so on throughout the entire car—judged by every mechanical and engineering standard, the Hudson "Twenty" is thoroughly up-to-date, without embodying any experimental features.

### *50 Miles an Hour*

Any Hudson "Twenty" will do fifty miles an hour It has all the power you could ever have use for. It not only looks like the most expensive cars, but it acts like them too. It is strong, speedy roomy and stylish

Please write today for complete specifications. The Hudson "Twenty" is the only four cylinder licensed car selling for less than $1,000. It is the first ideal car at the price

**Hudson Motor Car Company**
**Detroit, Mich.**

*Please send me catalog and name of nearest dealer*

*Name* .....

*Address* .....

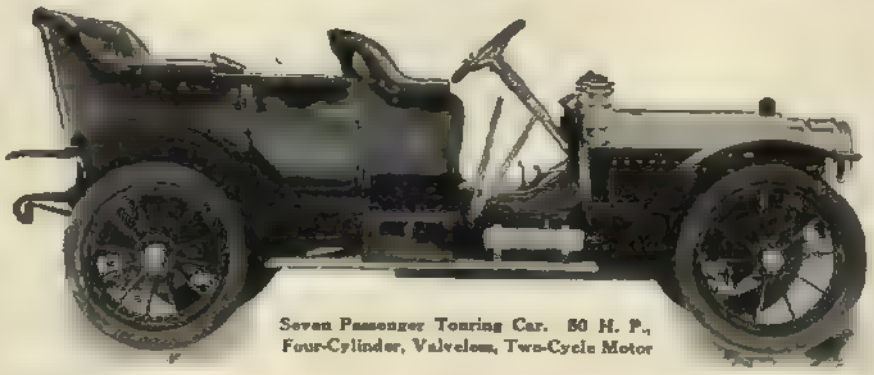
*City* ..... *State* .....

**Hudson Motor Car Company, Detroit, Michigan**
**(Members A. L. A. M.)**

*Not An Assembled Car*

# The American Simplex

**Fifty Horse-power Valveless, Two-Cycle Motor runs with the smooth rhythm and applies power with the constancy of the Electric Motor**



Seven Passenger Touring Car. 50 H. P., Four-Cylinder, Valveless, Two-Cycle Motor

THE day is inevitable when the two-cycle gas engine will be the only type used in motor cars.

¶ We have recognized the virtues of the two-cycle principle—pioneers among manufacturers of high-grade, high-powered cars.

¶ Every manufacturer who puts into his car a six-cylinder engine admits the vital deficiency of the four-cycle principle—intermittent power—and his inability to overcome it.

¶ Multiplicity of cylinders merely approaches—never attains—constant turning power—the continuous torque you hear so much about.

¶ The American Simplex valveless two-cycle engine applies power with the constancy of the electric motor.

¶ There is not a valve, spring, roller, cam or camshaft on the American Simplex two-cycle engine. They would be superfluous. They hinder the four-cycle from generating its power in a steady, unceasing rush—yet the four-cycle engine cannot be built without them.

¶ The American Simplex is manufactured in our own plant in its entirety—motor, transmission, differential, gears, frame—every part where strength or harmonious action is vital to the long life of the car and the smoothness with which its motor runs.

¶ That is the reason the American Simplex is a motor car symphony—it has that complete harmonization of parts which no assembled car can have.

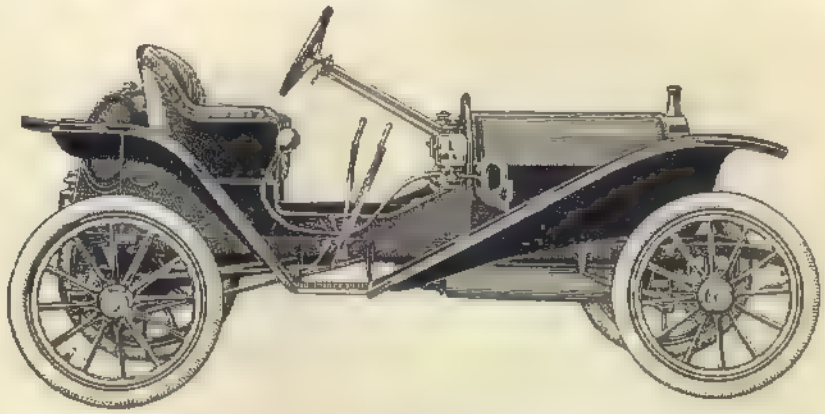
¶ Our 1908 literature tells of the flexible, three-point motor suspension; flexible radiator attachment; the rear axle transmission; the interlocking device on the gears; the improved torsion tube; the everlasting brake adjustment—every one a feature exclusive in the American Simplex—together with a comprehensive explanation of the differences between the American Simplex valveless, two-cycle motor and all four-cycle motors

¶ Write for it.

**SIMPLEX MOTOR CAR COMPANY, Mishawaka, Ind.**

Member A. M. C. M. A.

# Side by Side in the Same Private Garage with Cars of the Highest Price—the Dashing



## Hupmobile

**4 cylinders**
**20 H. P.**
**Sliding gears**
**Bosch Magneto**

**$750**
**(F. O. B. Detroit)**

"I want one of these Hupmobiles," says the man with the big income. "They're smart and stylish and I can jump in and skim away a dozen times a day where I wouldn't want to bother with my big car."

"I want one of those Hupmobiles" says the man with the more modest income. "They're just what I've been waiting for—a thoroughly sound piece of automobile engineering at a price that I can afford to pay."

Of these two classes who are buying them by the hundred, the first man to grasp the goodness and the soundness of the Hupmobile is the man who owns a fine big car which cost him five or maybe ten times as much money.

They see that it's the sturdy little "willing worker" of the automobile world. They see that it's full of snap, fire, vim, dash and style; and ready to leap into service in less time, as the chauffeur says, than it would take the big car to "fill its lungs with air and get ready to breathe."

The difference between the big car and the Hupmobile is just a relative difference—a difference in size but not in quality. Both are made from the same fine metals; both are the brain-children of skilled designers—the Hupmobile a long cherished ideal of E. A. Nelson, whose fine engineering ability has never lent itself to anything less worthy than cars of the highest calibre.

### Fifty miles an hour is no extraordinary speed for the Hupmobile—and, it will climb any hill that the biggest automobile can climb

After you've recovered from your astonishment at the dashing appearance of the Hupmobile, your first impulse will be to look for some lack of sturdiness in the construction to account for the $750 price.

You won't find it.

If you know anything about metals, you'll see that the steels employed are the very best and finest.

If you will examine the axles, expecting them to be slight and skimpy, you'll find instead rugged strength and toughness sufficient to support twice the weight.

When you lift the hood, you'll uncover a power plant that's a perfect gem of smooth and scientific workmanship—with an offset crankshaft all bearings made of Parson's white bronze; and a crankshaft absolutely noiseless in its operation.

When you come to the transmission, you'll find the selective sliding gear type—with gears cut from the hardest and toughest steel.

Even on the costliest cars you've heard the clash of shifting gears—but you'll listen in vain for that grinding sound on the Hupmobile.

These are a few of the Hupmobile features which will send your admiration for the little car up and up by leaps and bounds when you study it in the hands of the dealer and during a demonstration.

**Write for the literature and the name of the Hupmobile dealer.**

## Hupp Motor Car Co. (Dept. A), Detroit, Mich.

# White Town Cars
## For 1910

AS IN former years, we are giving considerable attention to the production of limousines and landaulets and we are now delivering these in both steam and gasoline models. Above is shown our Model "G-B" Limousine. In every detail of equipment and finish, the body represents the highest development of the body-builder's art. The five inside seats all face forward; three passengers are accommodated on the rear seat and two on folding seats. The chassis—the larger of our two gasoline models -was designed with special reference to the requirements of town car service.

An inspection will show that this car, selling at $3,600, compares favorably in every detail with that class of town cars which sell from $4,500 upward.

WRITE FOR CATALOG

## THE WHITE COMPANY

**860 East 79th Street**

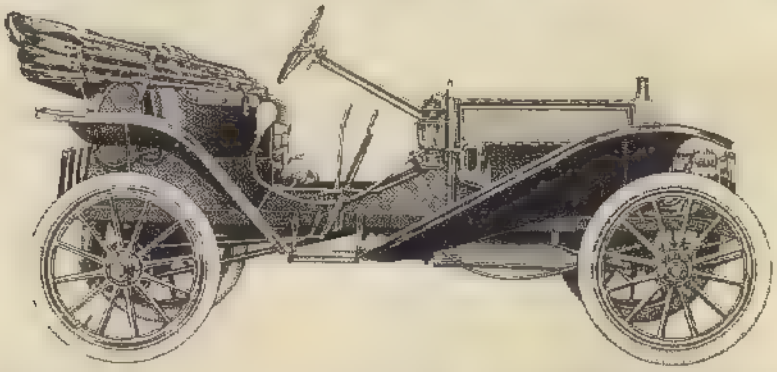
**CLEVELAND**

**OHIO**

New York City, Broadway at 62d St.
Boston, 320 Newbury St
Philadelphia, 629-33 N. Broad St.
Pittsburg, 138-148 Beatty St
Cleveland, 407 Rockwell Ave.

Atlanta, 120 122 Marietta St.
Chicago, 240 Michigan Ave.
San Francisco, Market St. at Van Ness Ave.
Toronto, 170 King St., West

# EVERYTHING THE BIG CAR HAS SAVE SIZE



## Hupmobile

**4 cylinders**
**20 H. P.**
**Sliding gears**
**Bosch Magneto**

**$750**

Until the Hupmobile came nobody had built a little car which was just as good as the best big car made.

The man who bought a roadster or runabout knew that he wasn't getting the same sort of engineering skill, workmanship and material that he got in the fine large cars

But the Hupmobile has changed all that.

If the makers of the best and costliest big cars in the country decided to market a moderate priced roadster they wouldn't produce a better car than the Hupmobile—because they couldn't

Their pride in their fine workmanship is no greater than our pride in ours

What they give you on a large scale the Hupmobile gives you on a small scale

It isn't a little car masquerading as a big one

It's a small car which is just as good in every detail as the best big one

The power plant is just as perfect

It's not as large as some others, but if you examine it with the experienced eye of a motor engineer you won't find it one whit inferior

It will do the utmost that a perfect power plant can do in proportion to its size

Its 20 horse-power is not mythical—the full 20 horse-power is there whenever and wherever you want or need it.

It's a perfect little glutton for hills and high grades. You can't discourage it any more than you can discourage the finest other motor of twice the horse power rating

And what's true of the motor is true of every other feature in the construction

You'd search in vain for anything inferior for any one part in the chassis that doesn't match the same part in a costlier car in everything but size.

Where will you see a sturdier, strong pressed steel frame, stauncher axles (fit for a car twice its weight), or a more noiseless system of sliding gears?

And what other roadster compares with it in snap, style and elegance of appearance—what big car, speaking proportionately is more distinguished?

Success has come to the Hupmobile in overflowing measure. In every community it has hosts of friends and its appearance on the streets is followed by a chorus of admiring comments

Ask your Hupmobile dealer to demonstrate its splendid speed, power and smooth running capacities and you'll be charmed with its performance

**And write for the literature.**

### SPECIFICATIONS

**ENGINE**—4 cyl., 20 H. P., 3½ in bore, 3½ in. stroke; water cooled offset crank shaft fan cooled fly wheel in front, Parsons white bronze bearings, no noiseless cam shaft.

**TRANSMISSION**—Selective sliding gears, shifting without noise

**CLUTCH**—Multiple disc type, running in oil.

**REAR AXLE**—Shaft drive

**BRAKES**—Two foot and two emergency (internal expanding) lined with Thermoid on rear hubs

**IGNITION**—Bosch high tension magneto

**TIRES**—30x3 inches

**WHEEL BASE**—86 inches

**TREAD**—56 inches.

**SPRINGS**—Semi-elliptical front, patented cross spring rear.

**EQUIPMENT**—Two side and tail oil lamps, dragon horn, tools, repair kit, pump.

**WEIGHT**—1100 pounds, regular equipment.

## Hupp Motor Car Company

**DEPT. 1A** **DETROIT, MICHIGAN**

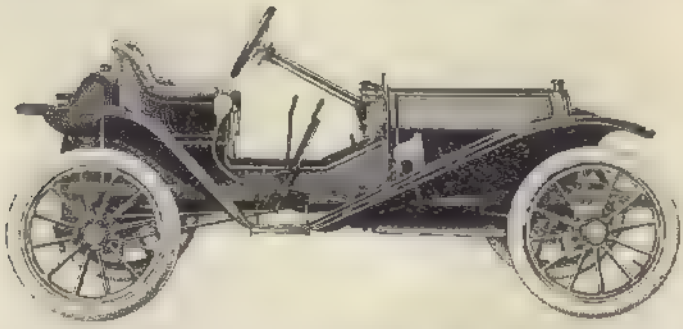
# FROM COAST TO COAST

## everybody says the same thing about the

# *Hupmobile*

4 cylinders
20 H. P.
Sliding gears
Bosch Magneto

**$750**



## "The smartest and the best little car ever marketed in America at anything like the money"

What people are saying in your community about the Hupmobile they are saying in every other community from coast to coast.

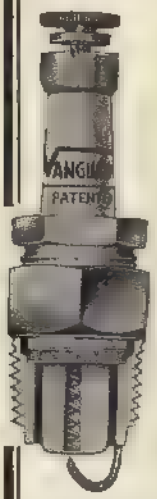
[illegible]

[illegible]

[illegible]

## VANGUARD SPARK PLUGS

act like a tonic on the "system" of the Automobile; they prime the best of cars for greater speed and make even "Ice Wagon" sit up and take notice. Do not let poor spark plugs and imperfect ignition mar your pleasure or interfere with your business.




TRADE MARK
VANGUARD
REGISTERED

stands for all that is best in automobile accessories and Vanguard Spark Plugs have set a new standard in ignition.

**$1** for ½" and metric, **$1.25** for the A. L. A. M. Liberal discounts to dealers.

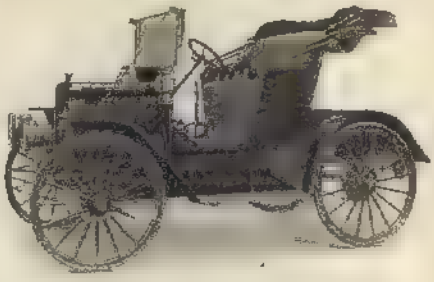
**Vanguard Manufacturing Company**
104 Cass St., Joliet, Ill.

Watch for our 1910 line of Wind Shields.

## H. H. BABCOCK COMPANY

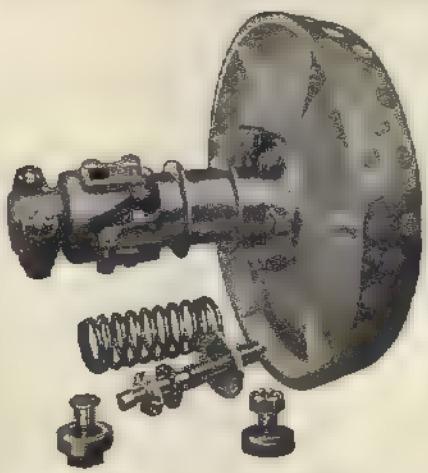
WATERTOWN, NEW YORK

**65 Years' Reputation Behind It**



## NOT A MOTOR BUGGY

but a solid tired Automobile. Freedom from tire and mechanical troubles is the result of owning a **Babcock.** Built only for those willing to pay for quality and workmanship. If you are looking for an automobile at buggy price, don't write us. Otherwise write us for further information and printed matter.



## B-T-K PARTS

Selective and Progressive Transmissions and side levers. Cone Clutches with Bronze or Leather Face with or without Cork inserts. Steering gears and universal joints. We do accurate gear cutting and are prepared to make estimates on your season's requirements.

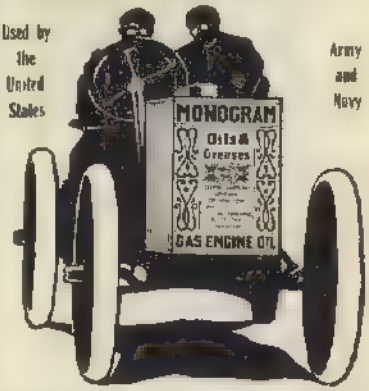
We make parts to your Blue Prints.

**Auto Parts Manufacturing Co.**
MUNCIE, IND.

## Monogram Oil

*"The Lubricant de Luxe"*

Used by the United States Army and Navy




*Monogram Oil* provides the maximum of motor efficiency at the minimum of annoyance and expense. Therefore it is

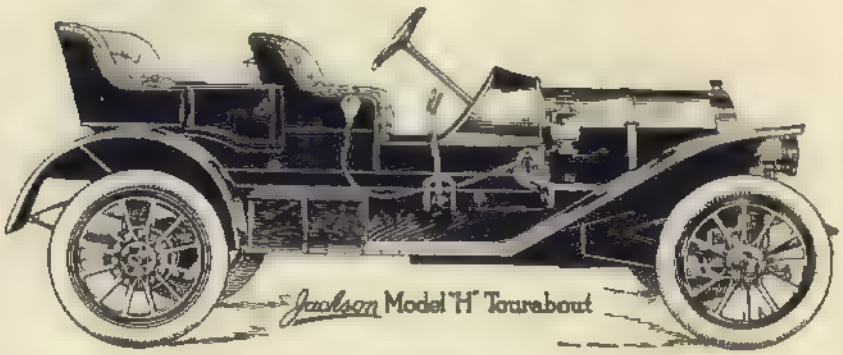
*"BEST FOR YOUR ENGINE"*

**Columbia Lubricants Co. of N. Y.** 116 Broad Street NEW YORK

*Branches in Principal Cities*

# JACKSON

## Model "H"—$1600




**4 Cylinder, 30 H. P., Bore, 4½"; Stroke, 4½"**

**Tires, 32 x 4. Gas Lamp, Magneto. Furnished with Touring or Tourabout Body**

**MODEL E—$2000.** Touring Car or Tourabout. 4 cylinder, 36-40 H. P., unit power plant, valves inclined in cylinder heads, overhead cam-shaft.

**MODEL C—$1250.** Touring Car. 2 cylinder, 20-24 H. P., chain drive.

**MODEL K—$950.** 4-passenger Touring Car. 2 cylinders under the hood, shaft drive, 15-18 H. P.

**MODEL F—$850.** Runabout. 2 cylinders under the hood, shaft drive, 15-18 H. P.

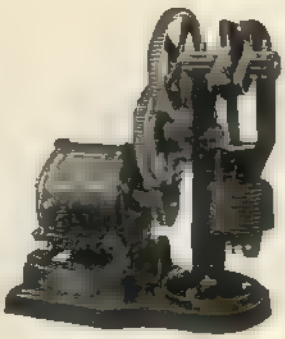
***WRITE FOR CATALOGUE***

## JACKSON AUTOMOBILE CO.

JACKSON, MICH.

# AIR COMPRESSORS
# FOR A WIDE VARIETY OF USES

## FOR THE GARAGE



**INDISPENSABLE** in the Modern Garage, because of:
Saving in labor.
Convenience in use.

A full line of small belt and motor driven Air Compressors, single and three cylinder styles.

Now is the time to install a complete plant.

## FOR POWER PURPOSES

A complete list of medium capacity Air Compressors in all styles for operating:

**Pneumatic Drills**

**Pneumatic Hammers**

Our complete Compressor outfits prove themselves invaluable when used in connection with Frame and Motor assembling for drilling, riveting and chipping.

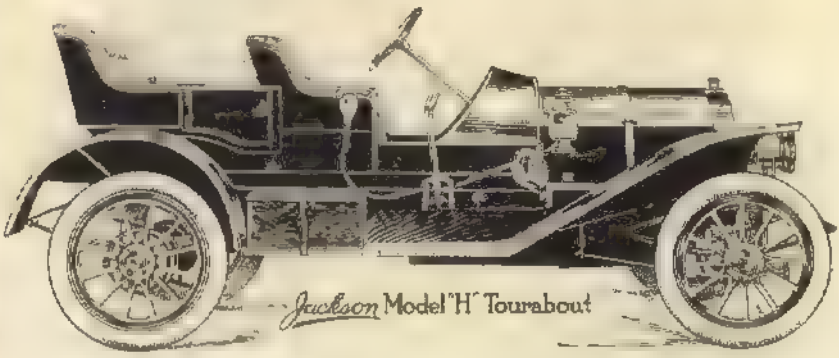
All of our designs are new and our construction is such as to withstand hard and continuous service. A circular upon request.

# THE F. W. SPACKE MACHINE CO.

INDIANAPOLIS, IND., U. S. A.

# JACKSON

## Model "H"—$1600

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**MODEL C—$1250.** Touring Car. 2 cylinder, 20-24 H. P., chain drive.

**MODEL K—$950.** 4-passenger Touring Car. 2 cylinders under the hood, shaft drive, 15-18 H. P.

**MODEL F—$850.** Runabout. 2 cylinders under the hood, shaft drive, 15-18 H. P.

*WRITE FOR CATALOGUE*

## JACKSON AUTOMOBILE CO.

JACKSON, MICH.

# JONES ELECTRIC HORN

The new Jones Electric Horn is FAR SUPERIOR to any other power-operated horn. It is a revelation to all who see or hear it. Possesses many distinctive features not found in any other automobile signal—made by Jones—a guarantee of superior workmanship, design and material.

## THE JONES HORN EXCELS FOR THESE REASONS:

Instant beginning and cessation of sound. Remarkably low current consumption (operates on 6 volt Storage Battery or 5 Dry Cells). Pleasing to the ear. Can be heard for a great distance. Simple in construction. Can't get out of order. Easily attached. Complete wiring to accommodate any car furnished with push button attached. Made in 3 different Models.

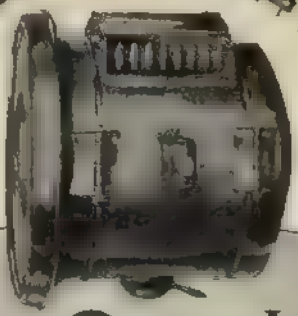
Model L Horn

With 12-inch bell and complete attachment, $25.00

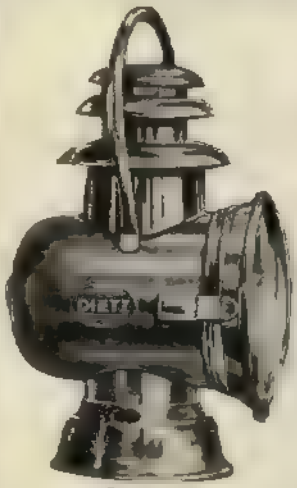
Model O Horn

With curved bell and complete attachment, $35.00

**JONES SPEEDOMETER DEP'T**
**UNITED MANUFACTURERS INC.**
Broadway & 76th St., - NEW YORK



# MOTOR CAR LAMPS AND GENERATORS



Dietz Orient

# DIETZ

## "ROUND TYPE" OF SIDE LAMPS FOR MOTOR CARS

**Adapted to use Kerosene, Acetylene and Electricity**

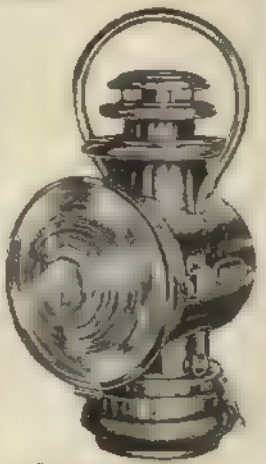
¶ For Large and Small Cars and the widening class of Buggy-Abouts, Surrey-Abouts, etc., they form perfect equipment where the square style is not adaptable.

**READY!**

Latest models of

DIETZ "ROYAL"
DIETZ "REGAL"
DIETZ "IDEAL"
DIETZ "ORIENT"
DIETZ "DAINTY"

**HANDSOME; WELL MADE; GOOD CANDLE POWER; BURN PERFECTLY.**



Dietz Orient Optical Lens

SEND US YOUR INQUIRIES AND LET US SUBMIT FIGURES

## R. E. DIETZ COMPANY

60 LAIGHT STREET, NEW YORK CITY

ESTABLISHED 1840

Our Catalog Shows Lamps for Oil, Gas and Electricity. SEND FOR IT

# MONEY WONT BUY

EVERYWHERE

because there are plenty of people who would rather sell the "just as good" grease than the real article. When you find you are having substitutes forced on you, for your car's sake, go elsewhere. When the leading mechanical engineers of America and Europe have endorsed

# Keystone Grease

AS THE

## *World's Greatest Lubricant*

you can't make any mistake if you insist upon having the genuine article. Jobbers and Dealers write for our special proposition.

## Keystone Lubricating Co.

EXECUTIVE OFFICES AND WORKS:

20th St. and Allegheny Ave., Philadelphia, Pa. Chicago Address: Tacoma Building
New York Office (Automobile Dept.), 1777 Broadway Boston Address: Oliver Building
New Orleans Address: 610-612 Chartres St.

WE HAVE NO CONNECTION WITH THE OIL TRUST

*"The Best car ever made at the price, and as good as any, whatever the price"*

TRADE KLINE KAR MARK

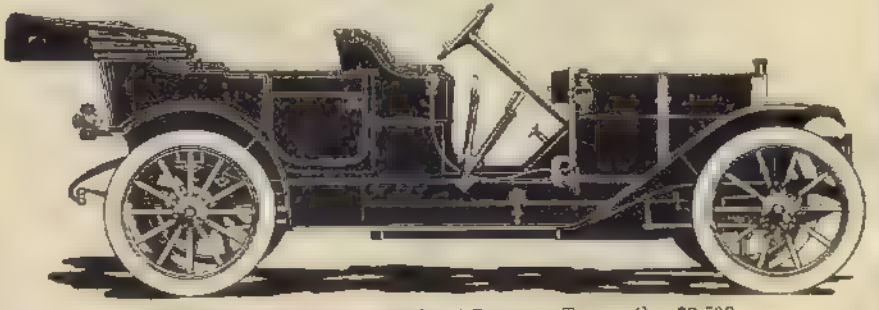
THE KLINE KAR has "arrived." It has taken its place unhesitatingly among the leaders. Since the first announcement of this wonderful car we have received hundreds of letters, telegrams and personal calls from agents all over the country, eager to handle the KLINE KAR.

This instant popularity is due to our specifications and price in a large measure, but also to the reputation of the designer of the KLINE KAR Mr. J. A. Kline, whose past success as builder of the "Putnam" is too well-known to require comment. In the KLINE KAR are embodied all the fruits of his many years' experience. Well-informed buyers know this. That's why the KLINE KAR is making good so quickly. It's the best to sell and the best to buy.

*Did you ever hear of a high-grade output, either with a new or old name, making good so quickly?*

*Pleasure and Commercial Cars for All Purposes*
*Write for detailed information*

**"A New Car by an Old Designer"**



Model 6-10, 40-50 H. P., 6 Cylinder, 5 Passenger Touring Car $2,500

BCK

*MANUFACTURED BY*

MOTOR CAR CO.,

YORK, PA.

*Write Dept. A for Information, Territory and Prices*

**PLEASURE**
**MODEL 6-40**
**MODEL 4-24**

TRADE **KLINE KAR** MARK

**COMMERCIAL**
**MODEL 2-16**

# ANNOUNCEMENT

## "A New Car by an Old Designer"

The alloy steel car with every improved feature known to the best American and Foreign designers together with our nine years of high grade automobile building and designing experience, which makes them the car of class.

The Automobile World unanimously agrees that an automobile over thirty horse power should be of a six cylinder type We offer our "Model 6-40" 40-50 horse power to meet this demand, you get speed and ability without excessive weight, your motor, instead of drawing a useless load, is giving you carrying and climbing ability.

MR. DEALER, NO MATTER WHAT AGENCY YOU HAVE THIS 1910 SENSATION WILL FILL THE GAP AND SWELL YOUR SALES BECAUSE IT DOES NOT CONFLICT WITH OTHER LINES AND IS IN A CLASS BY ITSELF.

In building the above car we have not lost sight of the same high grade construction in a four cylinder model, and we offer to the dealer our "Model 4-24" four cylinder 24-30 horse power to supply this trade.

We offer in connection with the above line the BRANCH of the Automobile business which heretofore has not been filled by a car designed solely for Commercial use.

This is a 16-20 horse power "Model 2-16" two cylinder opposed 1250 pound capacity truck which has the same careful design, material and construction as our other models, but heavier throughout to withstand the use subjected to a car of this type which exhaustive factory tests have proven.

A new factory with men of reputation in automobile and business experience.

Samuel E. Baily, President. Mr. Baily of the S. E. Baily & Co., Lancaster, Pa., and the York Carriage Co., York, Pa., who has for the past forty years been a leading factor as a manufacturer of carriages and other successful enterprises, and until recently was President of the York Motor Car Co., since its inception.

Jos. D. Carroll, Vice President. Mr. Carroll is Treasurer and General Manager of the Fiss, Doer & Carroll Horse Co., New York City, a large contractor and a leading light in financial circles.

J. Calvin Shuttle, Secretary. Mr Shuttle, a leading and conservative business man and capitalist of Lancaster, Pa.

Geo. W. Ryan, Treasurer. Mr. Ryan is General Manager of the York Carriage Co., and was formerly Secretary and Treasurer of the York Motor Car Co., York, Pa.

J. A. Kline, General Manager and Designer Mr Kline was General Manager and Designer of the York Motor Car Co., Manufacturers of the Pullman car, from 1905 to 1909 inclusive Mr Kline's success in the past as a designer of high grade motor cars that have given universal satisfaction to their owners is the best proof that the Kline Kar will be a success.

**We're pointing at you, Mr. Dealer, to secure territory for "the best cars ever made at the price, and as good as any, whatever the price."**

MANUFACTURED BY
BCK MOTOR CAR CO.,
YORK, PA.

*Write Dept. A for Information, Territory and Prices*

# A Profitable Suggestion

Copyright 1909 by E. M. Rosenbluth

¶ The far-seeing manufacturer of automobiles will do well to equip his cars, during the coming season, with the well-known Neverout Double Focus Searchlights, which are easily twice as powerful as the old-fashioned kind.

¶ The Neverout double focus idea throws a most powerful light far ahead, at the same time diffusing a secondary ray over the sides of the road, and makes night touring both safe and enjoyable.

## Universally Conceded to Stand Pre-Eminent

¶ Wise automobilists will insist on having their cars equipped with the Neverout Double Focus Searchlight, as it is the most powerful and the only steady and unwavering searchlight ever produced.

¶ Write right now for our proposition.

## ROSE MANUFACTURING CO.

**911 Arch Street, Philadelphia, Pa**

**Philadelphia Makers of the Celebrated Neverout Turn Over Generators**

# KOEHLER "40"

## AT $1650.00

represents the greatest value thus far presented in the automobile business, and we think we are justified in stating that no automobile introduced this season has created such a sensation. The "**Koehler 40**" is a car developed as the result of 12 years' experience in selling automobiles, and in design, material and workmanship it is equal to cars selling for $3000 and more. The type of body known as the "Montclair" is one of the most exclusive and luxurious styles introduced for 1910. High quality and low price are combined in the "**Koehler 40,**" and it is therefore a car for the man who wants the best and full value.

## DEALERS:—

We can give you the most complete and best selling line in the United States for 1910. It includes the

| | | |
|---|---|---|
| **HUPMOBILE** | **—4 cyl., 20 H. P., Runabout,** | **$ 750** |
| **RIDER-LEWIS** | **—4 cyl., 30 H. P., Touring Car,** | **$1050** |
| **RIDER-LEWIS** | **—6 cyl., 7-Passenger " "** | **$2500** |
| **KOEHLER "40"** | **—4 cyl., 5-Passenger " "** | **$1650** |

We are general distributors for these cars in the following territory.

**Koehler "40"**—United States.

**Rider-Lewis** —New York, New Jersey, Pennsylvania, Delaware, Connecticut, Rhode Island, New Hampshire, Vermont, Massachusetts.

**Hupmobile** —New York, east of and including Rochester, North Eastern and Central Pennsylvania, Maine, New Hampshire, Vermont, Massachusetts and Connecticut.

Write us now for agency proposition.

## H. J. KOEHLER CO.

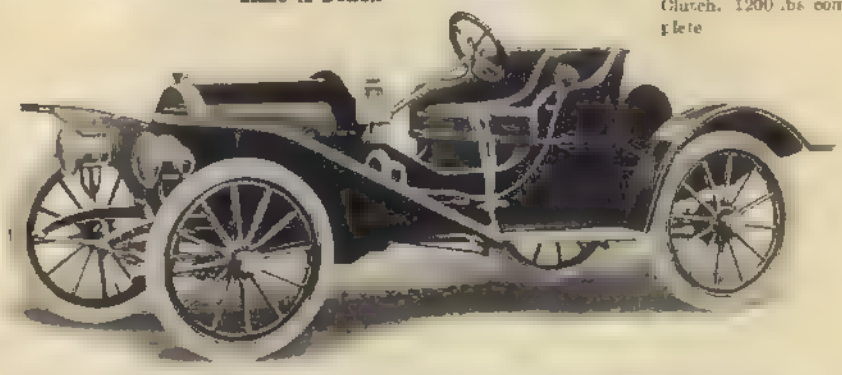
**1711 BROADWAY, N. Y. CITY**

# K-R-I-T

Made in Detroit

**22 Horse Power $800**

with Bosch Magneto, 96-inch Wheel Base, Sliding Gear Transmission, Multiple Disc Clutch. 1200 lbs. complete



## Built in Detroit by Men Who Know How

¶ We emphasize the classy lines, snappy, graceful style of the "saucy" K-R-I-T—the new car from Detroit. Look at the illustration—then note the specifications. ¶ The K-R-I-T unites class, speed, style, strength and power with light weight. You will recognize at once the value that spells BIG DEMAND. ¶ The factory is now in operation. We are building 1000 cars. Deliveries commence January 1. A few demonstrators sooner. Write at once for territory. First come, first served.

## Three Models, Runabout, Roadster and Surrey

### Condensed Specifications

**Motor.** 4 cylinders; 3½-inch bore, 4-inch stroke cast en bloc. Motor is suspended and runs with a point suspension. Crank shaft runs on two annular ball bearings. Connecting rods extra large in proportion to size of motor [illegible] frequent adjustment is necessary. Few [illegible]. Guarantee. The K-R-I-T passes 15 miles an hour easily—and better if you want it.

**Transmission.** Sliding gear type 2 speeds forward and reverse operated by one lever. Ball bearings. Noiseless.

**Clutch.** Multiple disc, running in oil. No jarring when starting. Starts as readily on high speed as on low. Slight pressure of foot releases clutch.

**Ignition.** Bosch Magneto with set spark.

**Oiling.** K-R-I-T system, contained in motor. Adjustable. Impossible to get out of order.

**Front Axle.** Drop forged I beam of exceedingly neat design.

**Rear Axle.** Shaft driven. Ball and roller bearing throughout.

**Springs.** 2 scroll platform springs in front, semi-elliptic rear, giving three point suspension, insuring remarkably easy riding.

**Wheels.** Artillery type. 32-inch rear, 30-inch front. Wire base. Number of spokes 56 each wheel.

**Steering Gear.** Irreversible type. One control lever.

**Brakes.** 2 sets of internal expanding brakes.

**Weight.** 1250 lbs. complete.

**Equipment.** 2 dash and 1 tail oil lamp, horn; tire repair and tool kit.

**Price.** Runabout $800. Roadster, $825 with single rumble. Surrey $850. F. o. b. Detroit.

**DEALERS!—Act Quickly**

Make your applications for territory at once. There will be only 1000 K-R-I-T cars built for 1910. WRITE TODAY.

**K-R-I-T Motor Car Company, Detroit, Michigan**

The "30"
Locomobile
30 Shaft Drive 1910 40 Chain Drive
The Locomobile Co. of America
Bridgeport Conn.
NEW YORK BOSTON CHICAGO
PHILADELPHIA SAN FRANCISCO
MEMBER ASSOCIATION LICENSED AUTOMOBILE MFRS.

# Locomobile
## 1910

**30 Shaft Drive**
**40 Chain Drive**

THE BEST BUILT CAR Locomobile IN AMERICA

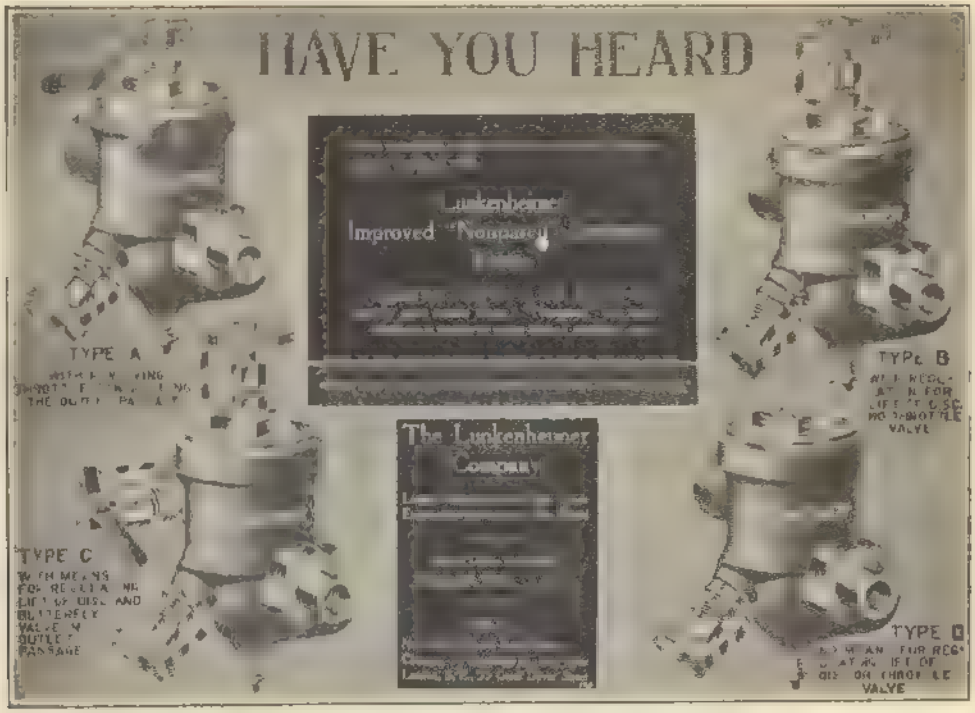
**Touring Cars, Roadsters**
**Limousines, Landaulets**

### LOCOMOBILE DEALERS

Albany, N. Y., Taylor Auto Co., 33 Orange St
Allentown, Pa., James K. Bowen
Amsterdam, N. Y., William Dave
Baltimore, Md., Callahan, Atkinson & Co., 1020 Morton St
Bangor, Me., S. A. Tee & Co.
Barre, Mass., H. Washburn
Bellefonte, Cal., A. Dreisbarg
Brooklyn, Conn., J. B. Simmons
Brockton, Mass., W. H. Marble, 91 Main St
Brooklyn, N. Y., I. S. Andersen Mfg. Co., 751 Grand St
Champaign, Ill., L. S. Wilcox
Charleston, Ill., A. L. Harum
Cincinnati, O., Hanauer Auto Co., 1 to E. 7th St
Cleveland, O., H. R. Hoffman Auto Co., 1868 Euclid Avenue
Columbus, S. C., Cobbs Machinery Company
Concord, N. H., New Hampshire Auto Co., 24 School St
Dallas, Texas, A. E. Tweedy
Danville, Ill., Robert Holmes & Bro.
Dayton, O., Peoples Motor Car Co., 19 W. Second St.
Des Moines, Ia., Iowa Auto & Supply Co.
Eau Claire, Wis., Robbs Supply Co.
Essex Fells, N. J., Stillman & Hoag
Fremont, O., N. Beebe
Fort Wayne, Ind., Harnishfeger & Charley
Fort Edward, Mass., W. W. Cheney, Sterling Garage
Fort Wayne, Ind., Bass Mfg. Co.
Fresno, Cal., A. L. Cox, 2345 K St.
Gloucester, Mass., Perkins & Corliss
Grand Rapids, Mich., Dudley E. Waters
Greenwich, Conn., Allen Bros., Greenwich Ave.
Hartford, Conn., Leonard Fisk
Honolulu, T. H., Schumann Carriage Co.
Houston, Texas, Moshart & Keller
Kansas City, Mo., Demster Machinery Co.
Lancaster, Pa., Lancaster Automobile Co.
Lexington, Mass., Fred W. Alton
Los Angeles, Cal., Los Angeles Motor Car Co., Pico and Hill Sts.
Louisville, Ky., George Looms
Lowell, Mass., Pascal Sprague
Marlboro, Mass., Frank Briggs
Memphis, Tenn., Bruce Cubbins Co.
Mexico City, Mexico, Compania Mexicana de Vehiculos Elec., 4 a Humboldt
Milwaukee, Wis., Schreiber Motor Car Co., 175 Fifth St.
Montgomery, Ala., Loeb Carriage & Supply Co., 120 Commerce St.
Natick, Mass., J. D. Macewen
Newark, N. J., Greene Motor Car Co., 90 Washington St
New Bedford, Mass., S. C. Lowe Supply Co.
New Britain, Conn., E. A. Cryne
New Haven, Conn., Automobile & Supply Co., 89 Broadway
New Orleans, La., Automobile Co., 1126 Tulane Ave.
New York City, Locomobile Co. of America
New York City, J. [illegible] Commander, 90 Wall St. (Stearns American Contract)
Norwalk, Conn., J. F. Lockwood & Co.
Oakland, Cal., S. S. Southworth, 7 Twelfth St.
Omaha, Neb., J. J. Dwight Co.
Ottawa, Ill., W. H. Knowles
Plainfield, N. J., Laing Auto & Supply Co.
Ponce, Porto Rico, Robert Graham
Portland, Oregon, A. E. Nears, 31 Seventh St. N.
Providence, R. I., Davis Automobile Co., 7 Dorrance St.
Rochester, N. Y., Gillis Strickland Motor Co., 28 Franklin St.
Rutland, Vt., McIntire & Grimm
Salt Lake City, Utah, Edwin G. Wooley Jr.
San Francisco, Cal., F. B. Southworth, 7 Laurel St.
Seattle, Wash., Marc Bannell, 707 Alaska Bldg.
Somerville, Mass., O. L. Hill
Spokane, Wash., H. P. Hoffheier, 62 Post St.
Springfield, Ill., I. R. Diller, 207 S. State St.
Springfield, Mass., Springfield Auto Co.
Syracuse, N. Y., F. H. Jones, 127 Oxford St.
St. Joseph, Mo., Wyeth Auto & Supply Co., 316 N. Second St.
St. Louis, Mo., Capen Motor Car Co., 4741 Maryland Pherson Ave.
Terre Haute, Ind., Haworth Auto Co.
Trenton, N. J., Trent Auto & Supply Co.
Tuxedo Park, N. Y., W. H. Wengant
Washington, D. C., Standard Garage Co., 2 2 14th St. N. W.
Wheeling, W. Va., House & Becker, 28 16th St.
Wichita, Kans., Smyth Motor Car Co.
Wilmington, Del., Bradford Company
Wilkes Barre, Pa., Wyoming Valley Motor Co., 35 N. Washington St.
Yonkers, N. Y., Yonkers Auto Station

## The Locomobile Co. of America
**BRIDGEPORT, CONN.**

**New York** **Boston** **Philadelphia** **Chicago** **San Francisco**




# Cullman Sprockets

For Diamond, Baldwin and Whitney Chains

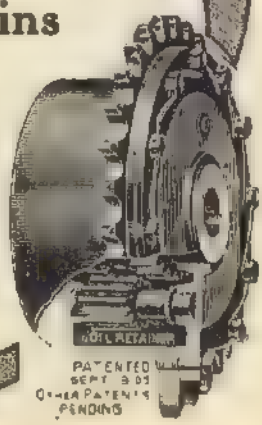
## Differentials

Sprockets in stock and to order

**Cullman Wheel Co.**

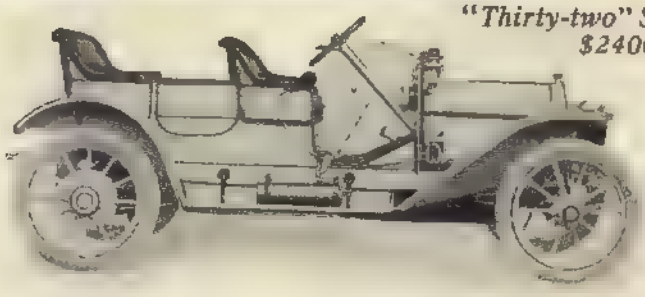
1340 E. Greenwood Terrace

Chicago



# THE MARMON

"A Mechanical Masterpiece"



*"Thirty-two" Suburban, $2400*

Whoever esteems a car's reliability and length of life as a vital factor in its actual value, will find the 1909 Marmon models intensely interesting. Manufactured entirely by us and unsparingly equipped.

*The "Thirty-two," $2400. The "Fifty" (7 Passengers), $3750.*

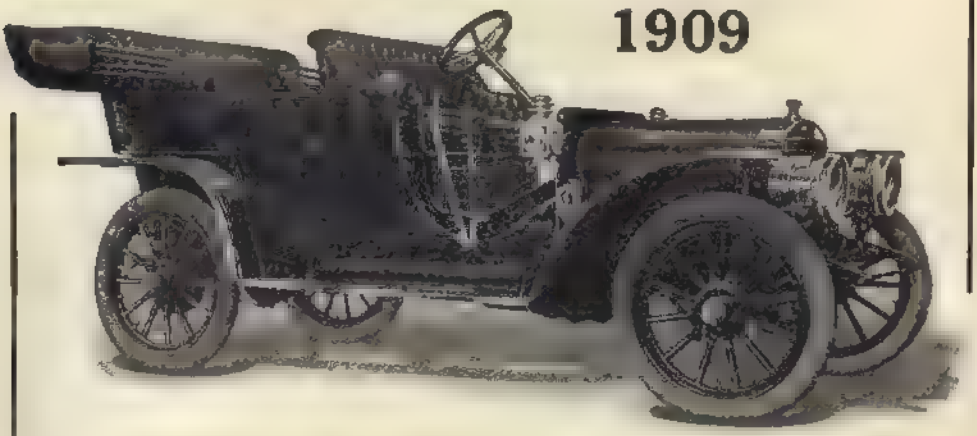
Nordyke & Marmon Co. (Estab 1851), Indianapolis, Ind.

*Standard Mfrs. A. M. C. M. A*

## The Easiest Riding Car In The World

# Dorris

## 1909



3-Point Suspension

Valves in Head

**Price, $2,500**

DORRIS MOTOR CAR CO. :: :: ST. LOUIS, MO.

# THE MARMON

MADE COMPLETELY HERE

## "The Easiest Riding Car in the World" —and the Factory That Produces It

For over fifty years the product of this factory has enjoyed a world-wide reputation for mechanical excellence.

All the resources of this vast industrial plant are put to the perfection of the Marmon "Thirty-two." No car is more carefully manufactured to give long and faithful service.

Its silence and smoothness of operation, its superior comfort, and its enduring reliability bear witness to its thoroughness of construction.

The value of the Marmon "Thirty-two" is readily apparent to anyone who knows the kind of design, materials, workmanship and equipment that distinguish a really high-grade car.

**Price, Complete** { Touring Car, Suburban or Roadster } **$2650**

**SPECIFICATIONS** —**Motor,** four-cylinder, 4½ in. bore by 5 in. stroke, 40 H. P. water-cooled with a Mercedes type honeycomb radiator. **Ignition,** Imported Bosch H. T. Magneto and battery, dual system. **Lubrication,** Marmon system of automatic force feed through hollow crankshaft. **Drive,** through live shaft. Selective transmission on three speeds forward and one reverse. Large diameter brakes, easily adjusted. **Materials,** absolutely the best of everything, including Krupp Chrome Nickel steels. Imported Hess-Bright bearings. Sarvaas wheels. **Tires,** 34x4 Q. D. Michelin Rims. **Wheel Base,** 116 inches. Weight (Touring Car) 4,000 lbs. **Bodies,** aluminum, hand-rubbed and hand-polished, body and cast aluminum hoods with side doors. **Equipment,** complete and highest grade.

*DEALERS who wish to figure on an agency for the best, moderate-priced, high-class car, should write us at once.*
*Promised deliveries easily made good.*

**Nordyke & Marmon Co.** (Estab. 1851) **Indianapolis, Ind.**

*Standard Mfrs., A. M. C. M. A.*

# Matheson

# Two More Perfect Scores

**Won by two 1910 Model Matheson Six-Cylinder 50 H. P. Shaft Drive, $3000 Cars**

in Binghamton, N. Y., to Boston, Mass., and return **800 Miles Contest,** June 21-26, over mountain roads.

**Do you know of any other make of car that has won so many consecutive victories?**

## OTHER RECENT VICTORIES

### FIRST AND SECOND

In Washington-Hagerstown, 168 Miles, Sealed Bonnet Contest, May 15, 1909, winning Washington Post Cup, against a field of 18 contestants.

### PERFECT TIME AND ROAD SCORES

IN NORRISTOWN-HAGERSTOWN 400 Miles Endurance Contest, May 18-19, 1909, against a field of 32 contestants.

### TWO MORE PERFECT SCORES

IN NEW YORK BOSTON 247 Miles Endurance Contest, March 11 1909, against a field of 20 contestants

### FIRST, SECOND AND THIRD TIME PLACES

IN PHILADELPHIA WILKES-BARRE 300 miles Mid-Winter Contest, against a field of 32 contestants, January 1-2, 1909 only three of the 32 cars had perfect scores, and

### THOSE THREE WERE "MATHESONS"

THE CONCLUSION—The Matheson Car has proved in every contest it has entered that it is far and away the most reliable and serviceable as well as the most economical and the fastest touring car in the world.

50 H. P. Six Cylinder Shaft Drive . . . . . **$3,000**
Equipped with choice of Touring, Tourabout Toy Tonneau, Close Coupled or Runabout Bodies.

50 H. P. Four Cylinder Chain Drive . . . . . **5,000**
Equipped with Touring Body.

Limousine or Landaulet . . . . . **5,750**

Roadster or Tourabout . . . . . **4,750**

## MATHESON AUTOMOBILE COMPANY

FACTORY: WILKES-BARRE, PENNSYLVANIA

**Main Sales Office, 1886-1888 BROADWAY, NEW YORK CITY**

# THE MARMON

"A Mechanical Masterpiece

"Thirty-two" Roadster, $2400

This car is manufactured entirely by us, in one of the world's largest, best equipped factories. There is nothing of higher grade, nothing of better design nothing with higher class equipment, at any price. Option of bodies.

*The "Thirty-two," $2400. The "Flyer" (7 Passengers), $3750.*

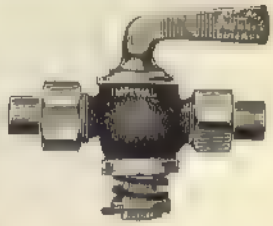
Nordyke & Marmon Co. (Estab 1851), Indianapolis, Ind.

*Standard Mfrs. A. M. C. M. A.*

The Easiest Riding Car In The World

# IMPERIAL

## Compression Couplings



For Connecting Copper, Brass, Aluminum and Steel Tubing Used

on Gasoline and Oil Lines

Patented Dec. 8, 1908.

We hereby warn the public that we shall hold all persons engaged or assisting in infringements of our patent strictly accountable for all damages to our trade which may result therefrom.

68 F

69 F

**SUIT HAS BEEN COMMENCED AGAINST A. NELSON, of Chicago,** for infringing our Patent.

66 F

70 F

**IMPERIAL BRASS MFG. CO.**

**242 S. Jefferson St., - - - CHICAGO**

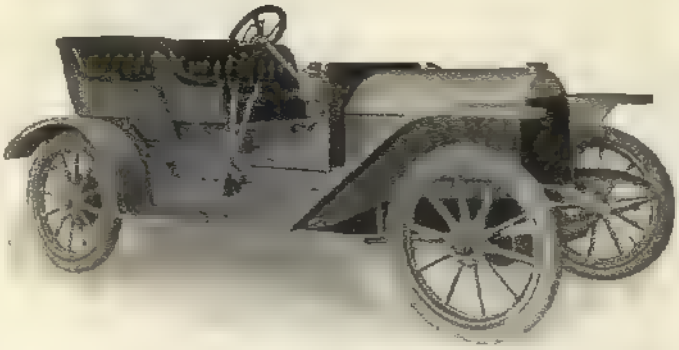
# Trim, Classy, Speedy and Efficient

4 Cylinders
4 ½-in. Bore

## FAL-CAR
IN THREE STYLES

30 H. P.
34-in. Wheels

Toy Tonneau, Roadster and Touring Cars ready for immediate delivery. Taxicabs for August delivery.

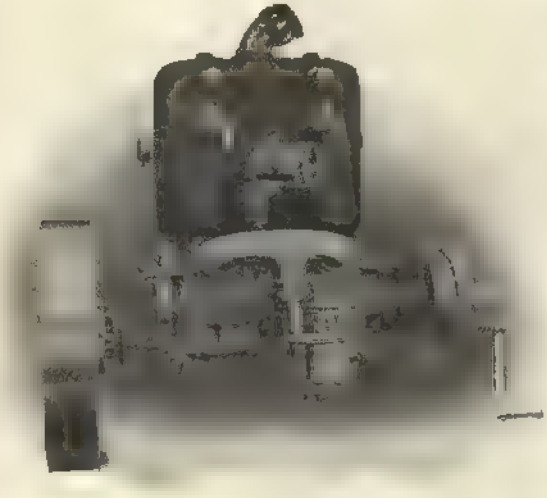


**Price, $1650**

Fully Equipped, including Magneto and Speedometer.

**THE FAL MOTOR CO.,** Dept. C-2 15-21 N. May St., Chicago
WRITE FOR CATALOGUE
Successors to the Reliable Dayton Motor Car Co.

# Don't Make the Mistake



of having your cars equipped with ONE type of engine, when ANOTHER is bound to be the most popular.

## Next Year will be a Two-Cycle Year

and the WILLET TWO-CYCLE ENGINE the favorite equipment, because it is free from the troubles which beset the four-cycle engine. It is a marvel of simplicity, and the new patented Rotary valve makes it silent, powerful and flexible. This valve is self-grinding, adjusting and needs no attention, allowing a full and positive charge to enter the engine regardless of speed or condition. It is the ideal two-cycle engine, and it will pay you to know more about it.

MADE IN SIZES FROM 8 TO 70 H. P.

**Willet Engine & Carburetor Co.,** 764 Ellicott Square BUFFALO, N. Y

# Matheson

# Two More Perfect Scores

**Won by two 1910 Model Matheson Six-Cylinder 50 H. P. Shaft Drive, $3000 Cars**

in Binghamton, N. Y., to Boston, Mass., and return **800 Miles Contest,** June 21-26, over mountain roads.

**Do you know of any other make of car that has won so many consecutive victories?**

## OTHER RECENT VICTORIES

### FIRST AND SECOND

In Washington-Hagerstown, 168 Miles, Sealed Bonnet Contest May 15, 1909, winning Washington Post Cup, against a field of 18 contestants.

### PERFECT TIME AND ROAD SCORES

IN NORRISTOWN-HAGERSTOWN 400 Miles Endurance Contest, May 18-19, 1909, against a field of 32 contestants.

### TWO MORE PERFECT SCORES

IN NEW YORK-BOSTON 247 Miles Endurance Contest, March 11, 1909, against a field of 20 contestants.

### FIRST, SECOND AND THIRD TIME PLACES

IN PHILADELPHIA WILKES-BARRE 300 miles Mid Winter Contest against a field of 32 contestants January 1-2, 1909 only three of the 32 cars had perfect scores, and

### THOSE THREE WERE "MATHESONS"

THE CONCLUSION—The Matheson Car has proved in every contest it has entered that it is far and away the most reliable and serviceable as well as the most economical and the fastest touring car in the world.

| | |
|---|---|
| 50 H. P. Six Cylinder Shaft Drive . . . . . | **$3,000** |
| Equipped with choice of Touring, Tourabout, Toy Tonneau, Close Coupled or Runabout Bodies | |
| 50 H. P. Four Cylinder Chain Drive . . . . . | **5,000** |
| Equipped with Touring Body. | |
| Limousine or Landaulet . . . . . | **5,750** |
| Roadster or Tourabout . . . . . | **4,750** |

## MATHESON AUTOMOBILE COMPANY

FACTORY: WILKES-BARRE, PENNSYLVANIA

**Main Sales Office, 1886-1888 BROADWAY, NEW YORK CITY**

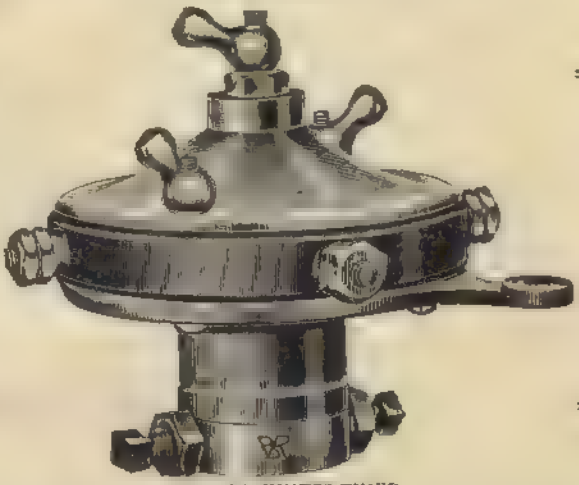
# The MAXIMUS Makes Motors Mote

Over 12,000 satisfied users. If you are not one of them, you should be: they save your temper, time and money.

PATENTED JUNE 2, 1908

**More Speed**

**More Power**



**Less Plug Trouble**

**Less Coil Trouble**

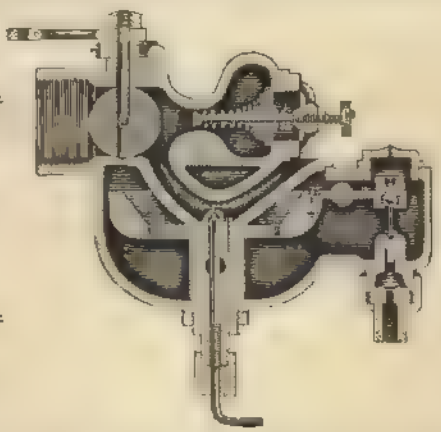
THE "MAXIMUS" TIMER

**We know** we have the best timer made, and that it will improve the speed power and smooth-running qualities of your motor; if it does not, your money will be refunded without argument. 85 per cent. of 1908 model machines are equipped with roller type timers. The Maximus is constructed on the principle of the best of these, but has several improved features that overcome the weak points of roller-type timers, and make the motor mote. A special Maximus, designed to be easily applied to 2-cylinder Buick and Models M and N Ford is now ready for delivery.

The unprecedented success of the Maximus Timer encouraged us to experiment in carburetion, and, after careful testing and improving, we are now ready to offer

## The MAXIMUS CARBURETOR

**Simplified Carburetion**



**List Price**

**1-inch Size, $11.00**

**1½-inch Size, $12.00**

The principal feature is the improved method of applying both the constant and compensating air. The small opening for the constant air creates a strong vacuum on the nozzle, resulting in throttling to very slow speed and ease in starting. The method of applying the compensating air does away with the sudden increased rush of air on the spray nozzle at change of throttle.

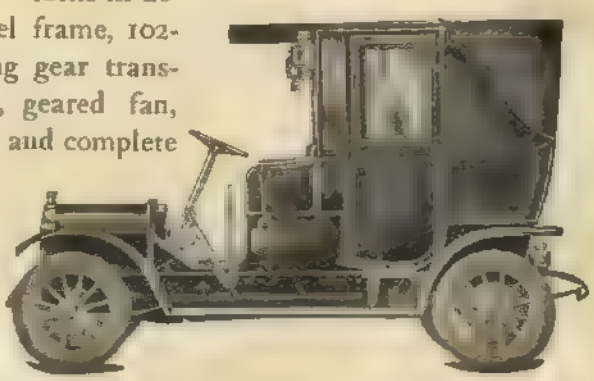
MADE BY

**The BECKLEY RALSTON CO., 80-82-84 Michigan Avenue, CHICAGO, ILL.**

# Atlas MOTOR CARS

## 20 H. P. *Taxicab* $2350

Seats five passengers—turns in 28-foot space, pressed steel frame, 102-inch wheel base, sliding gear transmission, geared pump, geared fan, geared oiler, 3 oil lamps and complete tool outfit with jack and tire repair kit.



***Progressive Taxicab Companies Are Quick to Recognize the Superior Features of the Atlas***

Let us tell you the reason for the great popularity of Atlas Taxicabs.

It is because of the 2-cylinder, 2-cycle engine with only five moving parts -that is practically indestructible -which so successfully solves the problem for power plant requirements.

Then there are other great advantages—the ample power, remarkable speed variation, the safe and easy control of both engine and transmission—the steering wheel and operating levers mounted on the left side—a decided improvement for safe running in crowded streets.

Garage men are quick to recognize these superior features that's why they pin their faith to the Atlas.

**Send for Illustrated Catalog and 2-Cycle Catechism**

# ATLAS MOTOR CAR CO.

Members A. M. C. M. A., 92 Birnie Avenue, Springfield, Mass

**1924 Broadway, NEW YORK ∴ Fred H. Adams, Manager**

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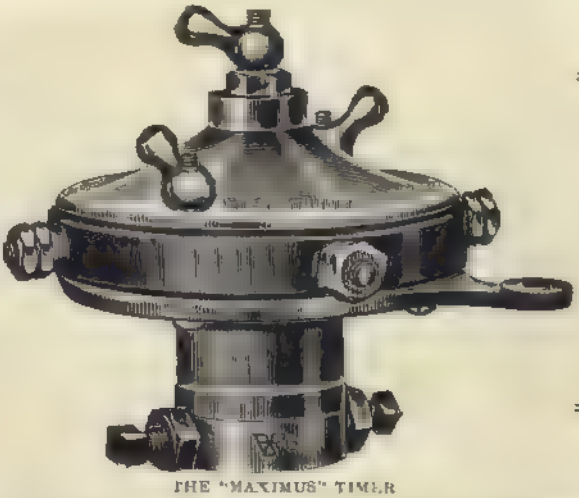

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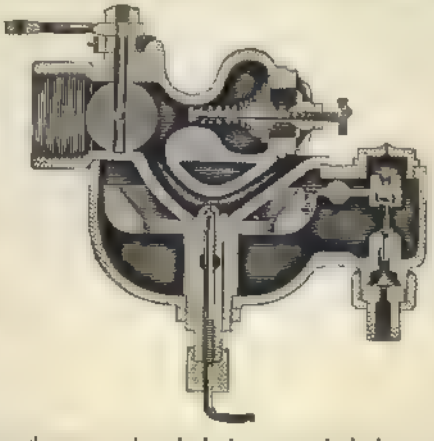

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MADE BY

**The BECKLEY RALSTON CO., 80-82-84 Michigan Avenue, CHICAGO, ILL.**

# Revision Up—or Revision Down—

Here is the question—before every motorist—day and night.

There are times when punctures, blowouts and other tire troubles seem to take particular delight in crowding a month full of tire expense items.

This you know. If you have motored much. Haven't you had those items of tire troubles and tire expenses so bound up in your thoughts as to crowd out important business matters?

Be honest. Hasn't this often been the case? Haven't your nights been burdened with nightmares of tire difficulties when you ought to have enjoyed restful repose?

But the place where you felt these difficulties and these expense items the most was when your monthly bill came in for new tires—for repairing old ones. [illegible] you will have [illegible] coming out of your morning's mail like a thief in the night.

If you had known a way to escape that bill you would have given considerable. Would you not, for the peace of mind alone?

And then the aching void left in your bank balance—when a check had gone in full settlement.

And scarcely before you realized it another month had rolled around. Another bill jumped at you from the day's mail.

Same thing has been happening with periodical regularity every month. Hasn't it?

Now aren't you about ready to take a step that will mean relief?

Relief—yes, we mean it.

Relief the very moment you step into your car. If your trip is ended. Relief in knowing that your pleasure jaunt is not to be marred by tire breakdowns, goodness knows how far from nowhere.

Relief—in your comfort—and in the comfort of your passengers.

Relief—in the positive assurance that there are to be no punctures, no blowouts, no possible chance of skidding.

Surely such relief is worth the while for you to experience. Then there [illegible] expense account. The position of tire expense is going to be reversed downward. Hitherto it has been going steadily upward.

That greatest item of motoring—your tire up-keep—will become the least.

And the way, for all this relief—relief from mental strain—relief from excessive expense—is easy to secure. And it is before you, waiting, and ready for you to apply.

The way is by the application to your tires of those tested tire protectors, time-tried and never found wanting.

# BRICTSON TREADS

## (DETACHABLE)

For four years now they have been gaining in popular favor.

Starting as needs be at the very foot of the ladder they have climbed higher and higher in the esteem of motorists the world over. They have worked their way up—because of actual performance. Because they have always fulfilled our every promise.

When we say—that they reduce tire expense—their use bears out our statement.

When we claim freedom from punctures blow-outs, skidding—the verdicts that these different tires are no longer present when his tires are equipped with Brictson Detachable Treads.

When we say tire expense is revised downward—instead of upward—refer to your monthly expense bill at the end of one month's trial—it bears out our assertion.

Brictson Detachable Treads are made from the best grade of Chrome Leather. With canvas lining studded closely with specially tempered steel studs and steel rivets.

Nowhere in their construction is there used inferior material.

Neither do Brictson Treads depend upon artificial fasteners for their adherence to the rubber tire.

Neither hooks, buckles, straps, wire fasteners in any shape or form are used.

Construction of these Treads and their application is easy.

By merely deflating the tire, forcing the tread over the tire, locking the edge between tire and rim and then inflating the tire to normal capacity the trick is done.

They are put on nearly as quickly as it takes to describe the operation. Removed just as quickly.

Then you are ready to enjoy real motoring.

What about the effect on the tires? Some one says.

Well, the effect is to preserve the tires. There is no danger of tires or treads creeping.

And no danger of rotting the tires.

Tires protected for months and months at a stretch by Brictson Treads and sometimes for over a year with out the removal of the tread have shown no wear whatsoever.

Brictson Treads take the abuse, the wear, the tear that formerly the tire was alleged to accept.

Then the real mission of the tire is accomplished. For the real envy of the tire is not lessened one particle.

The tire performs its original function of making mocoring over all sorts of thoroughfares—a pleasure and not a bone-racking torment.

Appearance? Please note we do not dodge any of the questions you might raise.

Well look at the actual illustration herewith given.

Doesn't look like they would detract from the appearance of your tires or of your car, do they?

And they won't.

The neatness of your car if anything, is increased through the use of Brictson Detachable Treads.

The last item is that of initial expense.

Brictson Treads cost about one-half of new rubber tires. You know that rubber tires are an uncertain commodity in price. Their tendency is up and up. Brictson Treads cost one-half and otherwise from three to six new rubber tires of the very best makes you buy.

Here then, is the solution of the whole problem of tire expense.

Since one Brictson Tread outwears three to six new tires and costs but one-half, it is equal, is it not, to from six to twelve new tires?

Four treads on your four tires are equal in efficiency—in results—to from twenty-four to forty-eight new rubber tires.

That's the answer.

What will you do about it?

The way as we have shown is before you whereby a positive and decided reduction in tire expense may be secured.

Surely your next move will be toward revision downward and not upward.

Ask today for our latest booklet, a booklet that states facts as they are on the tire expense question.

It handles this question to the point and without fear or favor.

It sets forth in support of all of our claims the statements of actual users of Brictson Detachable Treads.

And under their actual signatures.

This booklet "The Enemy of Tire Expense" is yours for the filling in and returning direct to us of the coupon herewith attached.

Do send this along right away. Then the first step to the revision downward you will have taken.

**Tear Coupon Off and Mail**

The Brictson Manufacturing Company,
Brookings, South Dakota.

GENTLEMEN: Answering your advertisement in Cycle & Automobile Trade Journal for December 1, I am interested and desire to know more about how I can cut down the question of tire expense. Please send to me at once your latest booklet, "The Enemy of Tire Expense," and submit quotations. This request places me under no obligation to buy.

Name _____

Address _____

Name of car I use _____

C. A.—12.

**The Brictson Manufacturing Company**

**Box C. A.—12** **Brookings, South Dakota, U. S. A.**

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PATENTED JUNE 2, 1908

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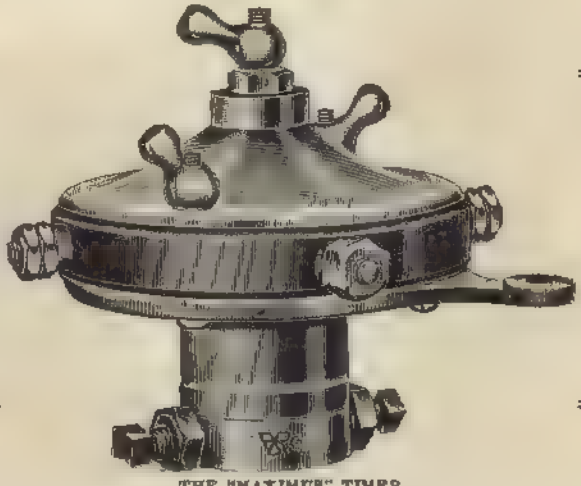

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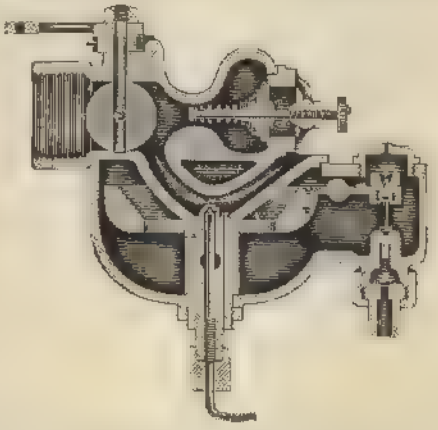

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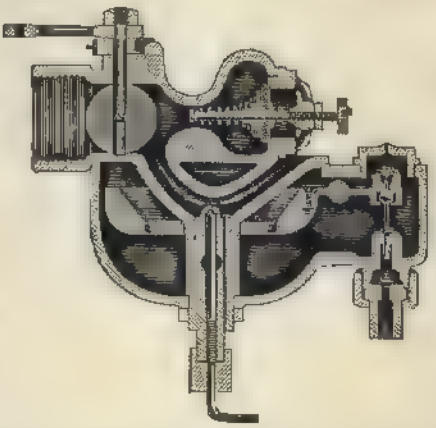

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# The Maxwell is THE Car for Touring

**THE confidence that Maxwell owners place in their cars was strikingly shown in the tour of the Maxwell-Briscoe Motor Club.**

Another instance of the reliability of the Maxwell is that of Mrs John R Ramsey and her three women companions who are touring from New York to San Francisco in a 30 H P. Maxwell -ask any Maxwell owner and he will tell you his car is **Perfectly Simple—Simply Perfect.**

Satisfy yourself on this automobile problem by asking the man who owns a Maxwell His reply will be something like the following letter. This is but a sample of the hundreds we receive We have collected them in a little book. It is yours for the asking.

Medford, Mass.
March 25, 1909

Maxwell-Briscoe Motor Company,
Tarrytown, N. Y.

Gentlemen :—

I thought perhaps you would like to put in The *Co-Operator a few words about a car that has been run 35,000 miles or more. It is an '05; motor No. 197. I have run it Summer and Winter through Massachusetts, Maine, New Hampshire, and New York, and furthermore the engine has never been overhauled since I had it. It is running so finely I would not like to part with it.

Yours truly,

J. W. BURNHAM.

*NOTE: The Co-Operator is a magazine that we publish twice a month. It is bright, interesting, and full of valuable information. Do you want your name put on the mailing list?

## A WORD TO YOU FROM THE PRESIDENT OF THE COMPANY

**On or about September 1st, I will announce our new line of Maxwell automobiles. Wait for this announcement, for I know that Mr. J. D. Maxwell has produced what will be the sensation of the year.**

Since 1904, the Maxwell has consistently ' made good." Over 16,100 satisfied users of Maxwell automobiles is the best proof of our success Naturally, we are proud of our record in the past—for the future our new line will offer the *greatest value that the American public has yet seen.* Write today and let me put your name on our mailing list for our advance literature.

Very truly yours,

Benj Briscoe Pres.

## MAXWELL-BRISCOE MOTOR CO.

P. O. BOX 110, TARRYTOWN, N. Y.

PAWTUCKET, R. I. MAIN OFFICE AND FACTORY NEW CASTLE, IND.

# The Mitchell Model "S"

**SIX-CYLINDER FIFTY HORSE-POWER 130 INCH WHEEL BASE**

## A KING'S CAR AT YOUR PRICE

Possessing all the quality of the high-priced cars, yet sold closer to its actual value than any other big car in the world

A car which shows what can be done when the desire exists—and when a car is built to the minutest detail in one's own factory, where values can be estimated to a hair.

We have just completed the finest automobile works in America and the first effect of our increased facilities is better cars for the same money in two instances and a better car for less money in another

The Mitchell Six is a direct development of the Mitchell Four of 1909. We have added two cylinders—increased the horse-power from 40 to 50—lengthened the wheel base to 130 inches—put on new and better springs—improved the beauty of lines and finish—and all without adding a penny to the price of the 1909 car—$2,000.

This is as classy and aristocratic a car as there is in America and it mustn't be embraced in the "cheap car" class, for it contains precisely the same materials as are used in the highest priced cars and is **cheap** only in price.

It will be the buy in 1910.

### SPECIFICATIONS:

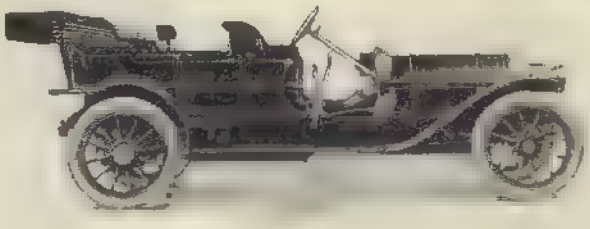
| | | | |
|---|---|---|---|
| Motor | 4½x[illegible] inches | Tool Boxes | Steel baked enamel |
| Transmission: | Selective type. | Seating Capacity | Seven Passengers |
| Wheels | 36x4 inches. | Steering Wheel | Nickel finish |
| Wheel Base | [illegible] inches | Springs | Platform type |
| Ignition | Magneto and dry Cells. | Body Options: | Seven passenger touring or close coupled body |
| Color | Dark blue, cream running gear. Option: Dark maroon, cream running gear. | Equipment. | Oil lamps and horn, full tool equipment, including a jack |

**PRICE, $2,000—F. O. B. RACINE**

Mitchell Motor Car Co.

Racine, Wis. U. S. A.

# Mitchell Bulletin



# A Greater Car For Less Money

## *Mitchell 5-Passenger Touring Car at $1,350.00*

This model sold in 1909 at $1 500. And it sold like hot cakes in all parts of America. Its performances under all conditions gave it a reputation that will last for years. Any man who owns one to-day will tell you unequivocally that the car never had a fault except the noise of its valves, and that wasn't a fault—it was more a joy to hear. The car earned its reputation and popularity solely by what it did and not by what we said about it.

**A FINER CAR THAN EVER and the PRICE IS LESS**

**This year it is an entirely new car—a Greater, Roomier, Easier Riding, More Powerful and More Beautiful Car, yet it is Offered at Exactly $150 Less than in 1909. This is the direct result of Increased Facilities and the Completion of Our Wonderful New Factory.** The lines of the car have been changed from the mediocre to the beautiful. They are artistic, graceful, refined. **The Noise Has Entirely Disappeared**, so that now the car is silent as the Foot of Time. Horse power has been increased. Wheel base has been lengthened and wheel diameter increased. The low broad radiator has given way to one of richer design and spring suspension so changed and improved that the easy riding qualities of the car are enhanced ten fold.

**SILENT AS THE FOOT OF TIME**

**TAKES ITS PLACE IN HIGHEST-CLASS COMPANY**

**This Car**, likewise our other two models will take its place in the very highest class company this year and maintain [illegible] the shadow of a doubt.

Specifications for Model [illegible] 4 cylinder 30-35 horse power **Motor**, 4½ x [illegible] **Transmission**, selective **Wheels**, 34 x 3½ **Wheel Base**, 112 inches **Ignition**, magneto and dry cells **Color**, dark blue cream running gear or maroon and cream running gear. **Tool Boxes**, steel. **Seating Capacity**, five passengers. **Steering Wheel**, [illegible] **Springs**, three-quarter elliptic **Body Options**, five passenger touring or close coupled body. **Equipment**, oil lamps and horn, full tool equipment, including a jack.

Attention is called to the creation of the **MITCHELL SIX**—a development of the 1909 four-cylinder 40 horse power car. This year it is a six-cylinder, 50 horse power, 130 inch wheel base—yet there is no increase in the price of $2000.00. This is the only six-cylinder car in existence that sells for as little money as $2000 and is highest class in every little detail.

**CREATION of the MITCHELL SIX $2,000.00**

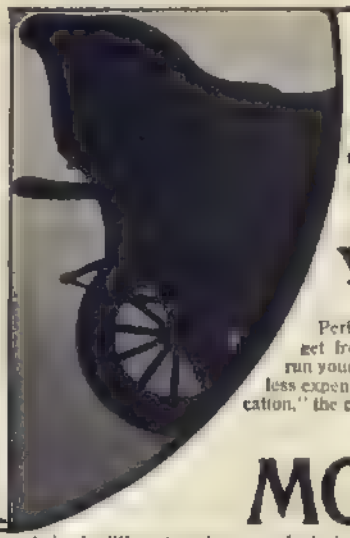
Don't overlook the **MITCHELL ROADSTER**, 30-35 horse power, wheel base of 100 inches, 4 cylinder, 3 passengers—the smartest roadster in the market at **$1,100.**

**THE CAR YOU OUGHT TO HAVE AT THE PRICE YOU OUGHT TO PAY**

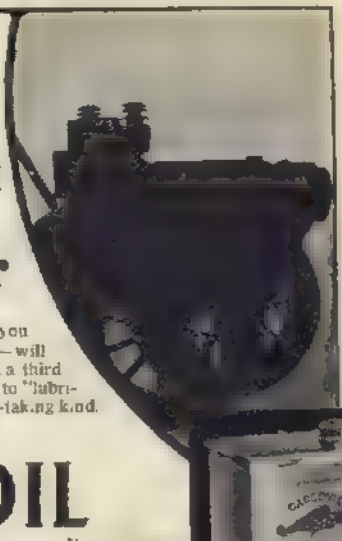
## Mitchell Motor Car Co.

## Racine, Wis. U. S. A.

F. O. B. RACINE



# Saves ⅓ The Cost of Your Car



Perfect lubrication—the kind you get from Vacuum MOBILOIL—will run your car a third longer and at a third less expense than if you merely trust to "lubrication," the common, careless, chance-taking kind.

VACUUM

# MOBILOIL

Is made in six different grades, one of which is made for your particular car. It saves you expense and experiment. It protects your car from friction, the hardest, costliest kind of motor wear.

*A valuable booklet on motor lubrication will be sent free on application. Lists every automobile made, and shows grade of MOBILOIL necessary for its perfect lubrication. Contains track records up to date, and facts of vital interest to motorists.*

MOBILOIL in barrels, and in cans with patent pouring spout, is sold by dealers everywhere.

Manufactured by

**VACUUM OIL CO., Rochester, N. Y.**

# YOU CAN NOT AFFORD TO USE UNRELIABLE LAMPS.

## HAM'S COUPE

**The Handsomest and Best Burning Small Square Lamp on the Market. A Very Attractive Design.**

# HAM'S LAMPS

## are always Reliable

They are built on the Ham Perfect "cold blast" principle, which insures a clear, steady, white light, that will not blow out in the strongest winds, or jar out on rough roads.

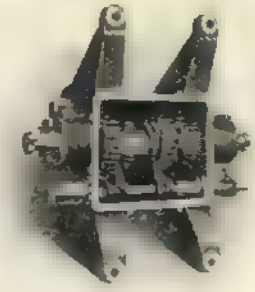
They are beautiful in design and finish. An ornament to any car, to give it the artistic finish.

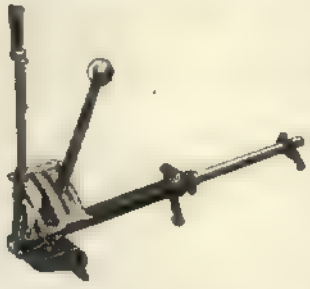
We have a very attractive proposition to offer Manufacturers of, and Dealers in Runabouts and High Wheel Automobiles.

Write for particulars. Address "Dept. D."

## C. T. Ham Mfg. Company

## ROCHESTER :: N. Y.





# 1910 TYPE E
# TRANSMISSION

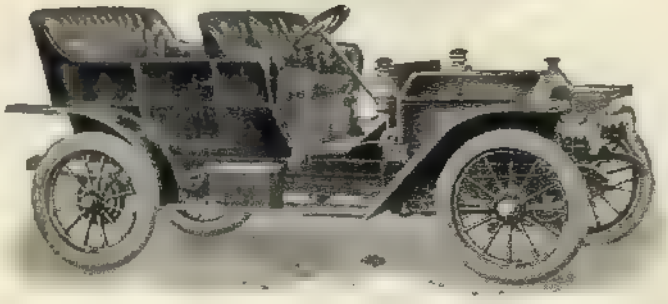
**Selective**
Three Speeds Ahead and One **Reverse**
Transmits 20 to 50 H. P.
Gears bolted to Flanges Integral with Shaft
F & S Annular Bearings Throughout.

*Write for*
*Descriptive Matter and Prices*

**A. O. SMITH CO.,** 257 Clinton Street MILWAUKEE, WIS.

# Pullman AUTOMOBILES

**Model K Touring Car, 30 H. P.**



**Price $2,000**

"Not only the best at the price; But the best at any price."

| | | | | | |
|---|---|---|---|---|---|
| Model L., 20 H. P. Runabout, | $1500 | Model 6-30, Light Speed Car, | $2500 |
| " L, 20 " Toy Tonneau, | 1600 | " 4-40, Roadster, | 3000 |
| " K, 30 " " " | 2000 | " M, Touring Car, | 3500 |
| " K, 30 " Touring Car, | 2000 | " M, Toy Tonneau, | 3500 |

Once "PULLMAN" always "PULLMAN"

**YORK MOTOR CAR CO., Inc.,** York, Pa.

Agents Wanted in Unoccupied Territory

UNLESS your car has perfect lubrication, your gasoline is used for friction instead of miles of speed. The use of Vacuum MOBILOIL saves the wear of your car, the waste of gasoline, and most of the money that goes for repairs.

Vacuum MOBILOIL is made in six different grades to suit the lubrication of every automobile made. One of these grades is exactly adapted to the needs of *your* car.

Its use is an investment that saves expense. It will end forever your lubrication troubles, and add to your pleasure and the life of your car.

*Write for free booklet showing grade of MOBILOIL adapted to the use of every car. Gives track records to date, and money-saving motor hints.*

**VACUUM**

# MOBILOIL

in barrels, and in cans with patent pouring spout, is sold by dealers everywhere.

Manufactured by

**VACUUM OIL CO., Rochester, N. Y.**

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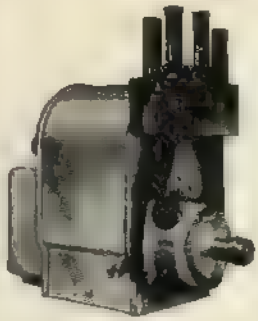
## C. T. Ham Mfg. Company

## ROCHESTER :: N. Y.

# PITTSFIELD

## DEALERS: SUPPLY YOUR TRADE WITH THE BEST

### Supply Them With Pittsfield Goods



Pittsfield High Tension Magneto

It is of the utmost importance to the energetic dealer that he keep fully abreast of the latest and most highly perfected developments in Ignition Supplies.

Pittsfield Goods set the Standard for Ignition Goods.

Magneto Spark Plug

**Pittsfield Magneto** has no moving wires. No Complicated Distributor, No Untried features. Furnishes a Hot Perfectly Timed Spark for every explosion. Greatest power of the motor and maximum efficiency of the fuel.

**Pittsfield Spark Plugs,** Mica Insulated, Specially prepared Electrodes to withstand the melting effects of high tension currents.

## PITTSFIELD SPARK COIL COMPANY, DALTON, MASS.

SALES REPRESENTATIVES. New England States, W. J. Connell, 36 Columbus Ave., Boston. Atlantic States, Thomas J. Weyard, 29 W. 42nd St., New York. Central States, H. V. Greenwood, K. Frank Peterson, 1st Lake St., Chicago. Pacific Coast, The Langendorf Co., San Francisco.

# $25.00

This is a brass trimmed shield intended for moderate priced cars. The same shield that was sold last year at $40.00 to $50.00. If you are looking for a shield at a bargain, here it is.

*Send for Complete Catalogue Showing Shields from*

**$12 to $75**

**BALL-FINTZE CO., 10 to 20 Canal St., Newark, O., 308-310 W. 3rd St., Cincinnati, O.**

# Lubrication Costs Less Than Repairs

Most of the bills for automobile repairs are really the cost of faulty lubrication in disguise. The grade of Vacuum MOBILOIL specially prepared for your particular car will give perfect lubrication and save time, trouble and money.

VACUUM

# MOBILOIL

is made in six different grades. One of these is the right grade for you The requirements of your car have been exactly determined, and this grade of MOBILOIL prepared for it with scientific precision.

*Send for booklet listing every automobile made and the grade of MOBILOIL prepared for it. Thereafter you need only watch the label on the can; the car will take care of itself. The book is free; its facts on the science of lubrication are invaluable. Gives track records to date, and other potent motor pointers.*

MOBILOIL, in barrels and in cans with patent pouring spout, is sold by dealers everywhere. Manufactured by

**VACUUM OIL CO., Rochester, N. Y.**

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Write for particulars. Address "Dept. D."

## C. T. Ham Mfg. Company

## ROCHESTER :: N. Y.

# The Oil That Turns Minutes To Miles

Vacuum MOBILOIL relieves your automobile of wear and friction, and leaves it free to wrestle with the minutes and the miles. It makes perfect lubrication a scientific certainty and saves paying for experiments and accidents, disguised as repairs.

## VACUUM
# MOBILOIL

is made in six different grades for various kinds of automobiles. One of these grades is the *one oil* the label of which guarantees it to be exactly suited to the requirements of your car.

*Do not experiment. Write for free booklet, listing every automobile made and showing grade of MOBILOIL necessary for its perfect lubrication. Also contains track records to date and other facts of vital interest to motorists.*

MOBILOIL in barrels, and in cans with patent pouring spout, is sold by dealers everywhere. Manufactured by

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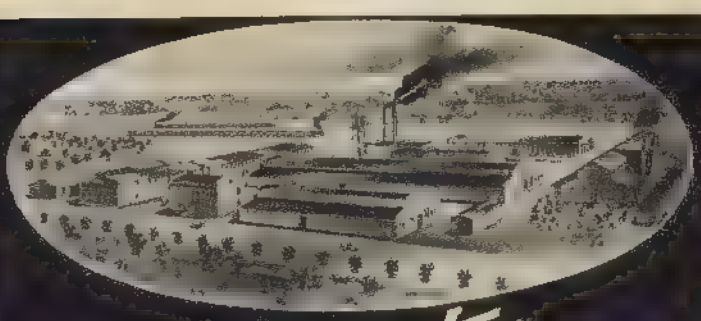


# Forced to Build a Bigger Factory

Since the remarkable record achieved by the Moline in the recent Glidden Tour, orders have been pouring in so fast we have been forced to add another big building, covering 600,000 sq. feet of additional floor space, to our already mammoth plant.

¶ The public were quick to recognize the exceptionally sterling qualities of the 1910

## Moline

### *The Perfect Score Car*

¶ And why not? When or where has any car demonstrated such high-class qualities, even at double the selling price of the Moline?

¶ The Moline has proved *decisively* it is no longer necessary to pay $3,000 to $4,000 for a car that will respond to *every demand* of the average driver.

¶ It covered the 2640 miles (15 days' run) over all sorts of roads without a single replacement, not even a fender bolt—finishing with a *perfect road score.*

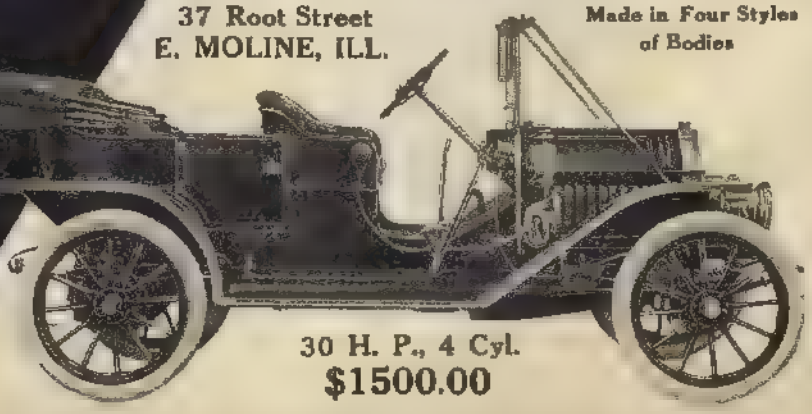
**WRITE FOR OUR NEW BOOK No. 37**

¶ Let us mail you "The Story of the Glidden Tour"—a beautiful, interesting illustrated book just off the press, giving some very valuable buying information. A post card will bring it, postpaid.

**MOLINE AUTOMOBILE COMPANY**

**37 Root Street**
**E. MOLINE, ILL.**

**Made in Four Styles of Bodies**



**30 H. P., 4 Cyl.**
**$1500.00**

# From Ocean to Ocean

The Military Mitchell car which left New York, August 19, bearing a dispatch to General Weston, of California, arrived in San Francisco September 19.

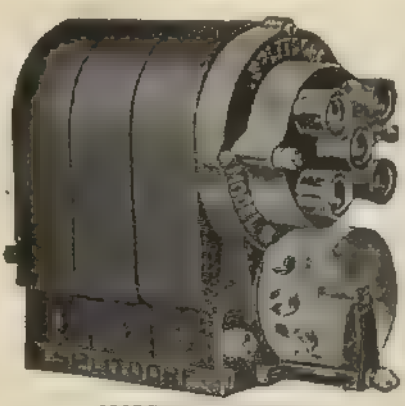
This car was equipped with a

# SPLITDORF MAGNETO

which during the entire trip gave the same faultless ignition for which it is so noted.

It is just such strenuous tests as this that prove to the utmost what a Magneto is made of.

It is a matter of record that the SPLITDORF Magneto has made good in every great run and race in which it has been used.



**MODEL B MAGNETO**

Chicago 319 Michigan Avenue
San Francisco 520 Van Ness Avenue
Detroit 868 Woodward Avenue
Boston Motor Mart

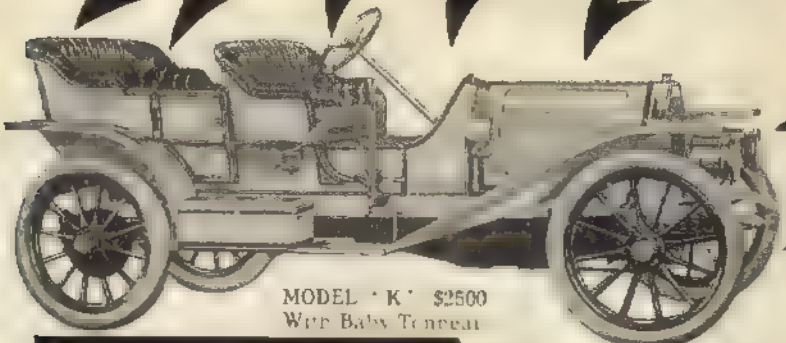
**It's demonstrated Efficiency and Reliability are the only reasons why so many discriminating motorists are equipping their cars with SPLITDORF Magnetos.**

**Why not equip your car likewise and have the same superior ignition? Ask for Magneto catalog.**

## C. F. SPLITDORF

**Walton Ave. and 138th St.**
**Branch, 1679 Broadway**
**NEW YORK**

**London Paris Turin Brussels Barcelona Johannesburg**



MODEL "K" $2500
With Baby Tonneau

**Also Furnished With Touring Body and Top**

# Every Part a Feature in Your Favor

We court the most exacting and critical inspection of every part of the Moline Model K. We gladly subject it to the severest demonstration test for prospective buyers.

In either case we know the result will be both favorable to buyer and seller. Every part about the

# Moline

is a point in your favor. We mean by that—every part is so constructed that it will give you the fullest measure of service and satisfactory operation.

The Moline motor is remarkable for its simplicity, smooth running, durability and freedom from the usual motor troubles. It is powerful, silent and responds in a way that makes the driver thrill with enthusiasm and confidence in his machine. Just write your name in the coupon and get some "facts" that will prove there is no car on the market equal to the Moline even at a higher price. Ask for catalog "E."

**Moline Automobile Co., East Moline, Ill.**

**Fill Out Mail To-day**

*Please send me Catalog "E" and oblig*

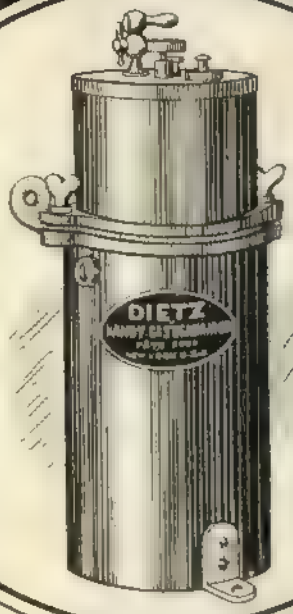
*Name* _____

*Town* _____

*State* _____

**"The Car For Anywhere"**

# Look into this




# DIETZ

## "HANDY" GENERATORS

(MADE IN THREE SIZES)

**We Ask a Close Inspection** of our latest model (Round Pattern) "Handy" Generator. This generator holds 2 lbs. of ½" carbide and is the acme of simplicity, consisting, as it does, of but four principal parts: (1) water dome, (2) double case (water jacket), (3) carbide basket, (4) ash receptacle.

**Emptied and Recharged** in half a minute with clean hands. Two-way outlet, safety vent and positive water drop. Modeled on handsome lines, heavy material and an ornament to a car. Price, $9.50.

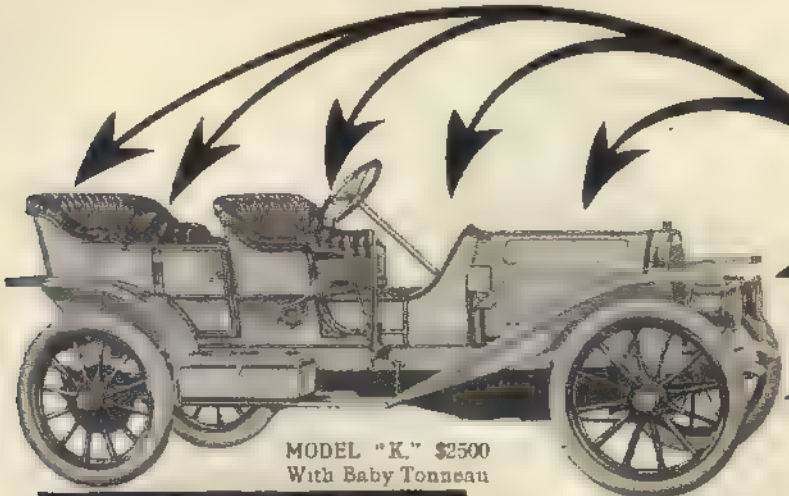
Headlights
Searchlights

**R. E. DIETZ COMPANY**
**60 Laight St., NEW YORK CITY**

Side Lamps
Tail Lamps

Be curious—Send for our Illustrated Motor Car Lamp Catalogue and prices

Manufacturers of Cars and Jobbers: Let us figure on your 1909-10 wants



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**Moline Automobile Co., East Moline, Ill.**

**"The Car For Anywhere"**

**Fill Out Mail To-day**

*Please send me Catalog "E" and oblige*

*Name* _____

*Town* _____

*State* _____

Exit the Horse—Enter the

# Four Cylinder 20 H.P. Hupmobile $750

What! Five thousand Hupmobiles for 1910?

Yes; and the first of the five thousand are being delivered now

Does that surprise you?

Have you been amazed at the sudden multiplication of these wonderful little cars on the streets of your town or city?

Have you tried to explain why "the little red streak" has leaped so swiftly into popular approval?

Have you discounted, or disbelieved entirely, the stories you have heard of the phenomenal sales of the Hupmobile?

Well, the answer is ready for all your conjectures—and for all your doubts, if you have had any.

Study the picture at the top of the page. It symbolizes precisely what is happening in all parts of the country—and forecasts what will happen in thousands of cases in the next twelve months

Conditions have been waiting for the Hupmobile.

What kind of a car then, is the Hupmobile, that it meets the universal desires and ideas, and threatens to displace the horse?

The shortest answer is—it is the kind of a car you've always said you would own if it ever came—a small car as graceful in line, as well-balanced and proportioned as the large ones; and as well and sturdily constructed throughout.

It is the only car at the price that is smart enough and powerful enough to find a welcome alongside of costly imported cars in the finest private garages in the country

The Hupmobile's 20 horse power motor is as nearly repair proof as any motor can be made.

It is strong and sturdy and powerful.

It will give you 50 miles an hour whenever you say so.

It runs smoothly and silently: and the harder the climb, the more stubborn the road, the more eager the little car seems to be for it.

This $750 car, competing with cars of two to three times its power and quadruple its price, already has won in two classes in the Porter Hill climb, Cleveland, June 12; and went through the gruelling four-day run · May · I lo of the Detroit dealers with a perfect score.

## FIVE THOUSAND HUPMOBILES FOR 1910 BEGAN TO BE DELIVERED JULY 1st FROM THE SPLENDID NEW HUPMOBILE PLANT IN DETROIT

The horse was foredoomed ten years ago, when the first gasoline driven cars were perfected

But the passing of the horse was a theory then—it is just beginning to become a concrete fact, now with the arrival of the Hupmobile.

People who owned horses (more than a million and a half of horse driven vehicles are built and sold in this country every year) waited for one particular type of car which would take their place.

Dozens of cars of different size, cost and power have been built in the fifty or more motor car factories in America Here and there they induced men to discard horses.

But none of them quite met the universal requirements. Until the Hupmobile came none of them quite persuaded the ordinary man to give up his horse. None of these cars was at once as small, compact, powerful and astonishingly swift—at least some of them that sold at so astounding a price.

So we say the Hupmobile was what horse owners and thousands of others were waiting for. When it came—the builders, with all their high hopes and convictions, were amazed at the warmth of welcome which it received.

The Hupp Company made modest plans to build 150 cars. The first month's experience forced that figure up to 250.

This was in the early months of the year. The added 100 cars were snapped up instantly. Since that time the output has gone up to 500—and every blessed one of them sold.

By herculean effort the Hupp Company was able to take advantage of the golden flood of orders that poured in. In less than six months from the time the first car was built a new plant, was planned, built and is now finished.

The 1910 car—the first of 5000 Hupmobiles which will be delivered during the current season—issued from the new plant July 1st

Five thousand cars. Five thousand Hupmobiles, when the contemplated output six months ago was 150. Just let the amazing significance of these figures impress themselves upon you.

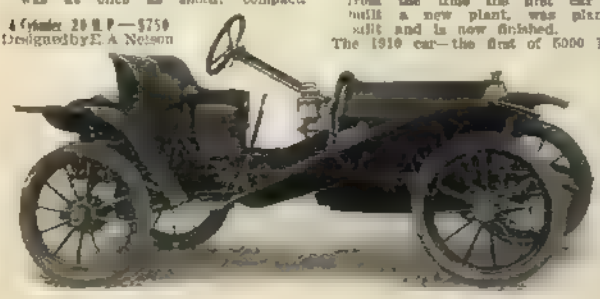
Do you think, now, that we exaggerated this announcement—"Exit the horse—enter the Hupmobile"

Watch the streets of your city. Watch the Hupmobiles increase, again and again and again. Watch your friends giving up their buggies, and surries and victorias, and coupes.

We predict right now that 5000 Hupmobiles for 1910 will not satisfy the demand.

If you expect to be among the fortunate 1910 Hupmobile owners, get in touch with us at once, and let us send you the literature which describes this astonishing car in detail.

4 Cylinder 20 H.P.—$750
Designed by E. A. Nelson



MOTOR—Four cylinder, 20 H. P.; offset crank shaft water cooled

TRANSMISSION—Selective sliding gears running noiselessly

REAR AXLE—Shaft drive, Hyatt roller bearings.

CARBURETER—Breese, with hot air connection.

IGNITION—Bosch high tension magneto.

WHEELBASE—86 inches, tread, 56 inches.

SPRINGS—Semi elliptical front; patented cross spring rear.

WEIGHT—1100 pounds, with regular equipment—two side and one tail oil lamps, dragon horn, tools, repair kit and pump.

PRICE—$750, F. O. B. Detroit.

**HUPP MOTOR CAR COMPANY [Dept. A], DETROIT, MICHIGAN**

# Mosler SpitFire Lead the World

Power. Speed. Economy.

The Plug with the Deepest Chamber.

ARTHUR R. MOSLER — GEO. A. MOSLER

An instrument of extremely high efficiency. Small, light, most self-contained. Substantial, simple to adjust.

M&B

Results of nine years' experience. Perfect fuel strainer. Flooding and back Firing impossible.

## Carbureter

*"It's So Simple"*

## Umph Timer

Double ball bearing. Self-adjusting. Self-centering clutch.

Made to fit any shaft any engine.

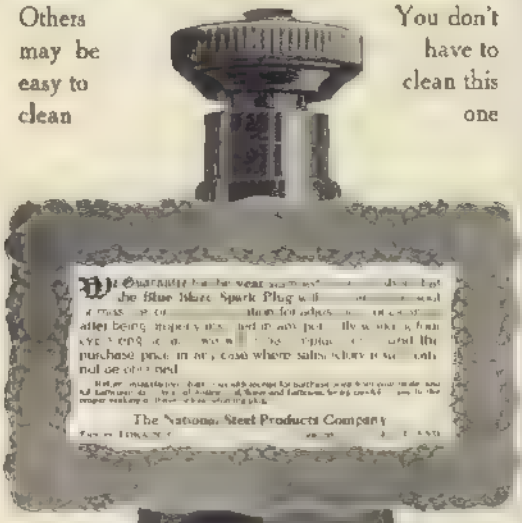
No friction, no wear
Wobble impossible

A. R. MOSLER & CO. 163 W 29TH ST. NEW YORK

# Guaranteed not to be taken from your cylinder for the entire year

Others may be easy to clean

You don't have to clean this one




Mica only

$1.50

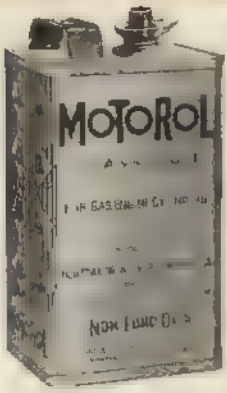
Don't this look good?

See the Inner Shell

See the Sharp nose

*Send for Catalog of IGNITION GOODS*

**The National Steel Products Co.**
**500 Superior Bldg., Cleveland, O.**




# The Oil That's Best by the Service Test

Did you select your car by the color of its paint? Did you judge its speed by smelling the exhaust?

Hardly. The reputation of the manufacturer was the basis of your venture.

Then why not select your oil as you selected your car?

Do not judge oil by color or smell; do not rub it on your palms to test it—do not adopt popular fallacies.

Seek out the manufacturer who has achieved success in automobile lubrication and has outstripped competition.

**MoToRoL**
**"It suits because it doesn't soot"**

is perfectly balanced in the essential qualities—**High in Lubricating Value Non-Carbonizing—Excelling in Lasting Properties High in Fire Test and Low in Cold Test.**

Because our reputation is behind that statement. We would be less willing to offer a trial than you to buy it.

You risk getting a poor oil without knowing it—you learn of it too late, at too great cost.

Test one gallon of "MoToRoL." Note the immediate improvement in the action of your engine.

Our lessen the loss. "MoToRoL" vaporizes better than other oils and can be used more economically.

Carbonizes the valves. Compression is better. You get more power with a less explosive mixture.

Because your cylinders. You've an easier job to crank and your cylinders are clean.

The gallon of "MoToRoL" has gone further than your usual oil and you've burned less gasoline.

What does all this mean in the long run? Lower upkeep cost.

Try MoToRoL.

If your dealer is not supplied, write us, mentioning his name and the make of your car. We will forward free sample.

Produced by
**New York & New Jersey Lubricant Co.**
DEPT. D
**165 Broadway :: New York**
Originators and Sole Manufacturers of
**NON-FLUID OILS**
Which are used and recommended by over sixty manufacturers of leading automobiles.

Sales Agents
**UNITED MANUFACTURERS**
**Broadway at 76th St., :: New York**

# VASCO

## Wind Shield

Yes, it *looks* like the others, but when you examine it closely it is *vastly different*. Works on a *new* principle—*friction discs* instead of springs. *One hand* operates it. You can tilt it as you like. The "gap" is an important feature—protects you, yet gives you a *clear view ahead*. Price, $35.00—$15.00 *less than inferior shields cost*

## "SEE THAT GAP?"

# VASCO

## Grindine Compound

Obviates *danger* and *expense* of oil and emery. Contains the *hardest* and *sharpest* abrasive obtainable. *The most perfect valve-grinding compound known.* Put up in a carton containing *two tubes*—one coarse, one fine. Price, 25 cts. Also packed in larger size tubes containing *five times* the amount, at 75 cts. per pair. Our GRINDINE COMPOUND for Brass will be found of superior quality

GRINDINE COMPOUND

Write for VASCO Catalog TODAY

*VICTOR AUTO SUPPLY MFG. CO.*
*43 West 43d St., New York*

# The SPEEDOMETER TEST

¶ How many miles are there in a gallon of oil?
That depends on the oil.

¶ How many miles are there in a gallon of gasoline?
That depends on the oil.

¶ How many miles are there in an hour?
Depends on the oil again.

¶ How many miles are there in your car?
It all depends on the oil and the Speedometer answers you truthfully.

¶ If you care about these things, *you* can depend on

# MoToRoL

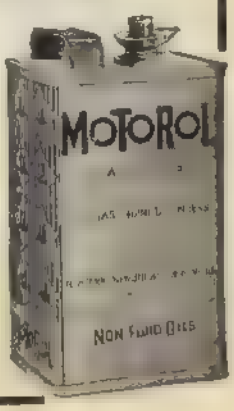
to give you maximum returns from your discrimination in using it.

¶ We ask you to use it after a good speedometer test against all other oils.

¶ Get a test gallon of your dealer. Write us if he is not supplied. Address, Dept. D.

¶ MoToRoL is produced by the Originators and Sole Manufacturers of Non-Fluid Oils.

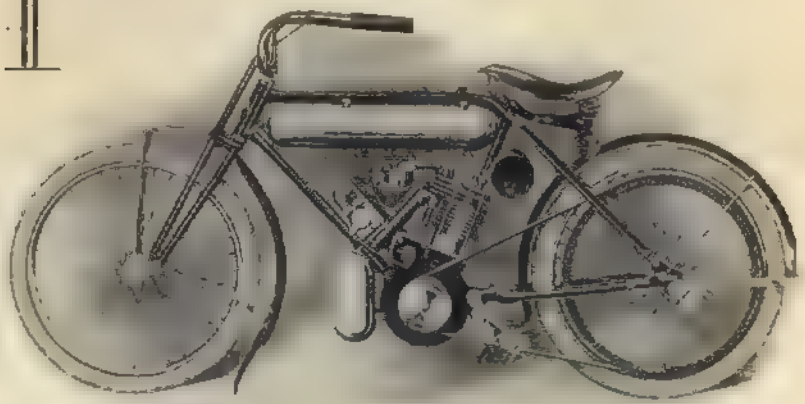
NEW YORK & NEW JERSEY LUBRICANT CO.
DEPARTMENT
United Manufacturers
Broadway & 76th St.
New York City



# A 13" GUN

shoots farther and hits harder than any other gun used, but you wouldn't buy one for pleasure purposes.

¶ Just so with Motorcycles. There are specially built racing machines that go faster than the M. M., but no other machine rides as easy or runs as smooth.



¶ It requires easy riding to get and hold the best trade the kind of trade there's money in; the kind of trade that is waking up to the pleasure of Motorcycle riding; the kind of trade that has the money and demands comfort, simplicity, smooth and quiet running.

¶ Perfect score in F. A. M. Endurance Run.

¶ 1910 Models for immediate delivery.

¶ Contracts made now will be renewed for 1910.

¶ Get the agency for the cleanest Motorcycle ever created.

¶ Let us send you free for six months our magazine "Sparks," a Motorcycle monthly.

## AMERICAN MOTOR COMPANY

**715 CENTRE STREET :: :: :: BROCKTON, MASS.**

DISTRIBUTING STORES

| | |
|---|---|
| American Motor Company, | 218 Clarendon Street, Boston, Mass |
| Geo. P. Jenkins, | 10 W. 60th Street, New York City |
| [illegible] | [illegible] Main Street, Buffalo, N. Y. |
| G. M. Greene, Mgr. Am. Motor Co., | 2127 Michigan Avenue, Chicago, Ill |
| American Motor Co. of Texas, | M M Building, Dallas Tex |
| Lincoln Holland, | 1034 S Main Street, Los Angeles, Cal |

# The Neverout

TRADE MARK

# Motorcycle Oil Lamp

## A Combination of Head Light and Tail Light in One Lamp

Note Double Clamp Bracket and Rear Signal –Prevents Accidents.

Neverout is the most perfect motor cycle and bicycle lamp ever produced.

Neverout is acknowledged to stand pre-eminent.

For 10 years the world's standard.

Patent German Silver Reflector enables Neverout to project more light than most gas lamps.

The only motor cycle lamp that positively stays lit and will not rattle apart.

**Jobbers, write for our proposition. Your catalogue not complete without Neverout**

**Write to-day.**

## ROSE MANUFACTURING CO.

**911 Arch Street, Philadelphia**

National

## Costly Construction

The improvements on the National from year to year constitute a very good history of motor car development. It has generally been somewhat in advance, but its departures have always soon become standard practice with the best manufacturers.

In the introduction of the all-ball-bearing motor, however, only a few of the highest priced cars—all costing much more than the National—have followed it. It is expensive construction, but no expense is spared at any point to make the National the best.

*Four Models--Fours and Sixes --from $2,750 to $5,000.*

**National Motor Vehicle Co.**
**1903 East 22nd St., Indianapolis, Ind.**



## How to Choose The Right Car

I

### The Rear Axle

LOOK carefully at the *rear axle* of the car you are about to buy. Don't underrate *its* importance. If it breaks, the "hind-legs" of your machine are hopelessly out of commission. You are stalled for good and all. You can't even be towed—you come home ingloriously *on a truck*.

Who can say what the rear axle must endure? The power of the engine?—Yes, *that* can be figured. The shock of fast driving over rough roads?—Yes.

But who can compute with what force the wheels will fall into a rut of unknown depth, or how hard they will impact against an obstruction of unknown height and rigidity? And all at an unknown velocity.

Plainly, the rear axle must be "above suspicion;" it must be stronger than any strain it can possibly encounter—harder than any jolt it may receive.

Note, therefore, these points about the rear-axle mechanism of

Glide

## Cars for 1910

No weight-economy here. The needed weight is good—it gives traction to the wheels. And prevents the disastrous "figure-8's" that skidding entails.

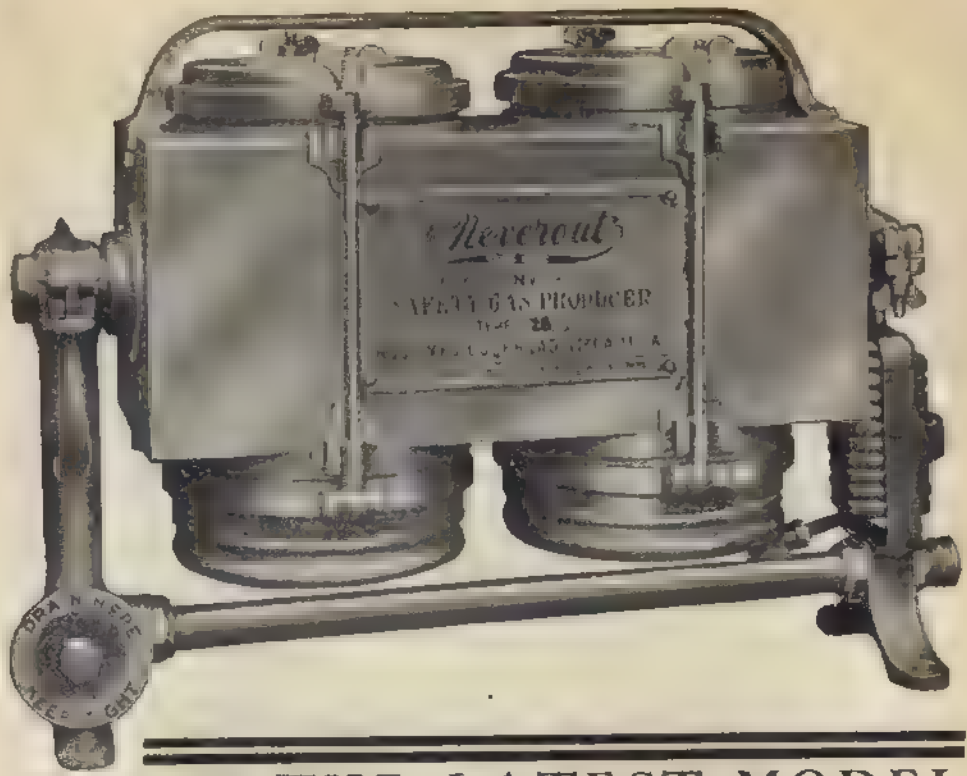
Here is the Glide rear axle. The metal is there. It looks strong; it is strong, and every ounce is stress-resisting metal. No dead weight.

Glide axles have no light keys or *pinned-together parts*. The most important parts are made integral—in one piece.

The simplest, most serviceable construction known to the mechanical art.

Let us send you full facts about the new Glide Cars for 1910. The greatest Automobile values of the year. Address as below

**The Bartholomew Company**
**210 Glide St.**
**Peoria, Ill., U.S.A.**




# THIS IS THE LATEST MODEL OF THE FAMOUS

# Neverout

TRADE MARK

## Patent Invertible System of Gas Generation

for lighting automobiles and motor boats. It stands absolutely in a class by itself and has overcome the trouble with common, so-called generators Lights instantly and can be repeatedly relighted after standing for long periods of time, as the carbide is separated from the most ashes by the invertible method.

¶ This system is the only correct system and is now being used by the United States Government on the Isthmian Canal, as well as the most expert and most careful automobilists throughout this country and Europe.

¶ The Neverout contains a new patent system of cooling and purification, thereby delivering to the lamp burners pure acetylene gas, which burn at the highest known brilliancy Moisture is entirely eliminated when gas reaches the burners, thereby insuring the life of the burners to an indefinite period –a point of economy which cannot be overlooked.

¶ Write for free catalog, also describing the Neverout Double Focus Searchlights, twice as powerful as the old-fashioned kind.

¶ *The Neverout Double Focus Searchlights are the only automobile searchlights which are steady and unwavering under all conditions.*

## ROSE MANUFACTURING CO.

**911 Arch Street :: :: :: Philadelphia, U. S. A.**

# The Neverout

TRADE MARK

## Motorcycle Oil Lamp

**A Combination of Head Light and Tail Light in One Lamp**

For 10 years the world's standard

**Note Double Clamp Brackets and Rear Signal--Prevents Accidents**

The Neverout **Motorcycle Oil Lamp,** by means of its patent glass covered reflector, throws more light than most gas lamps. It is the only satisfactory motorcycle lamp on the market to-day and positively will not rattle apart. A examination will show its many novel and exclusive features which cannot well be stated in an advertisement but must be seen and used to be appreciated.

The only motor cycle lamp that positively stays lit and will not rattle apart.

**Jobbers, write for our proposition. Your catalogue not complete without** The Neverout

Write Today

**Rose Manufacturing Co., 911 Arch St, Phila.**

# A Striking Demonstration

OF THE

## Road-Riding Qualities

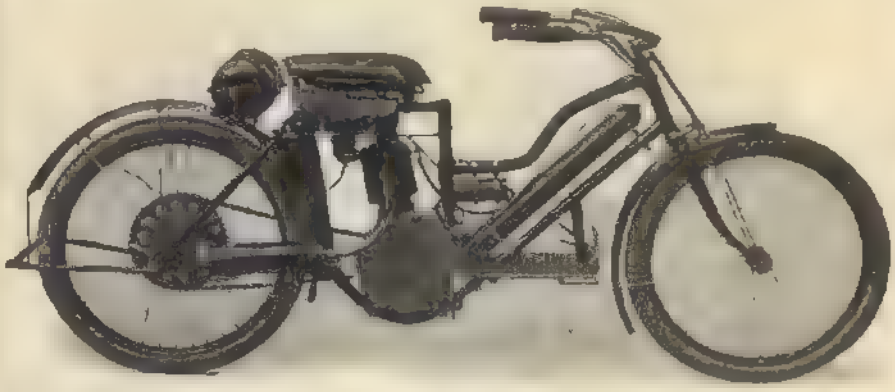
OF THE

# ) New Era Autocycle (

**In the F. A. M. Endurance Run Cleveland to Indianapolis**

## ONE PERFECT SCORE

One Score of 975 Points No New Era Rider Had to Push His Machine at any Point through the 378 Miles of the Most Gruelling Contest Conducted by the Federation.



PATENT PENDING

## Two Speed Gear and Free Motor Worked Perfectly

The New Eras were Ridden through Miles of Sand and Climbed EVERY HILL on the Course, While Scores of other Riders Were Compelled to Dismount and Push Their Machines.

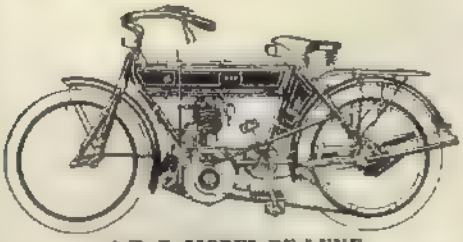
## Comfort, Endurance and Dependability

These are the MOST STRIKING Characteristics of the New Era. If you are Live and Progressive, you will write for our agency proposition.

## New Era Gas Engine Company

**7 Dale Avenue** **Dayton, Ohio**

# N. S. U. THE WORLD'S BEST MOTORCYCLES



4 H. P. MODEL DE LUXE

have proven themselves well capable of holding their own over the most consistent performances of the season as well as by winning the numerous severe endurance trials, reliability tests, etc., and holding up

**26 WORLD'S RECORDS**

for speed, from 1 to 24 hours. Such performances cannot be set aside when you are considering the Motorcycle question.

If you are in the business, write us for thoroughly protected territory. You'll also find Catalogue "A" interesting.

**N. S. U. MOTOR COMPANY**
206 W. 76th Street :: New York City

# You're in Business for Big Sales, Good Profits, Delighted Patrons!

Then be sure that every motorcycle you handle is equipped with the

## Eclipse Coaster Brake

It's the only motorcycle brake that can be absolutely depended upon.

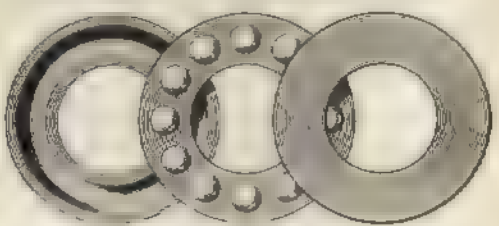
May we give you further particulars?

**Eclipse Machine Company, Elmira, New York**

THE STAR

# THE STAR BALL RETAINER CO.

Lancaster, Pa., U.S.A.



Complete Thrust Bearing

Radial Retainers

**Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings, Special Stamping, etc.**

# GEER MOTORCYCLES

| | |
|---|---|
| 3-H. P. 1-cylinder GEER Model 6 | $225.00 |
| 4-H. P. DEMAND | 200.00 |
| 2¼-H. P. GEER Model 4 | 150.00 |
| Used motor-cycles | 40.00 |

We have the largest line of new and used motorcycles in the country at the lowest prices. Every machine guaranteed. Repairs a specialty. Motors and castings for air-ships. Motors for railway velocipedes. Send for catalogue

HARRY R. GEER CO.
856 McLaran Ave. St. Louis, Mo.

# NEW ERA AUTO-CYCLE

TWO SPEEDS, FREE MOTOR, HAND-CRANKED MOTOR

**The New Era Gas Engine Company**
7 Dale Avenue, Dayton, Ohio

GET THIS BIG MOTORCYCLE BOOK FREE

It contains much valuable information that you should have. If you intend to buy a Motorcycle or Motor, or if you have a Motorcycle and want prices on Accessories you should not miss this opportunity to get this FREE book of useful information.

Send Stamp today to

Motorcycle Equipment Co. Hammondsport, N. Y.

Winner of the Only Diamond Medal, 1908

F. A. M. Endurance Run

The 1909 Harley-Davidson

better than ever

SEND FOR CATALOGUE

HARLEY-DAVIDSON MOTOR COMPANY

MILWAUKEE

MERKEL-LIGHT

BELT AND CHAIN-DRIVEN

MOTORCYCLES

have more exclusive meritorious features than any other motorcycle on the market—a strong statement, but substantiated by facts. Get our catalog for details about the Merkel Ball Bearing Motor; Spring Frame and Fork; automatic mechanical force feed lubricator; leverless and jointless handle-bar control, etc.

It's free for the asking.

MERKEL-LIGHT MOTOR COMPANY, Pottstown, Pa.

Motorcycle Accessories

Send for largest and most complete catalogue ever issued. Indian & Harley-Davidson Motorcycles, $50 Up.

F. B. Widmayer Company, 2312 Broadway New York City

Torpedo Motorcycles

WHY HESITATE? Unless you ride the BEST you cannot be a SATISFIED MOTORCYCLIST. You know there can be but one BEST and that is the TORPEDO. Write for catalog and agent's terms.

The Hornecker Motor Mfg. Company

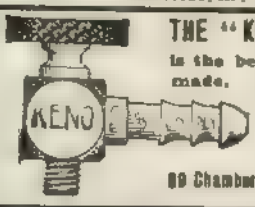
Geneseo, Ill., U. S. A.

SPROCKETS

for Bicycle and Motorcycle

THE PARISH & BINGHAM CO.

Cleveland, Ohio




THE "KENO CONNECTION"

is the best pump nipple ever made. One sample for 15c.

Stevens & Co.

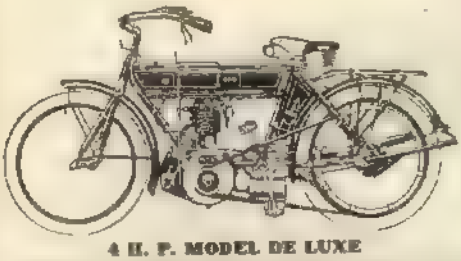
89 Chambers St. New York City, N. Y.

Chilton Stock Designs OF Post Cards

Are Money-Makers for Automobile Dealers. Send for Specimen Sheet No. 101

CHILTON PRINTING CO., Market and 49th Sts., Phila.

# N. S. U. MOTORCYCLES



4 H. P. MODEL DE LUXE

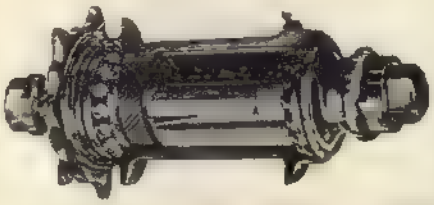
are motorcycles which will never give trouble—machines that will cost less for upkeep and repairs than any other on the market, because of their honest, substantial construction and strictly high grade equipment.

Besides being exceptionally evident in all endurance and reliability trials, the N. S. U. holds the most important speed records in the world.

Write for our 56 page catalogue "A;" also for territory, if you are in the business.

**N. S. U. MOTOR COMPANY**
204 W. 76th Street New York City

# There is One Sure Thing



You won't derive the fullest enjoyment from your motorcycle until it is equipped with the

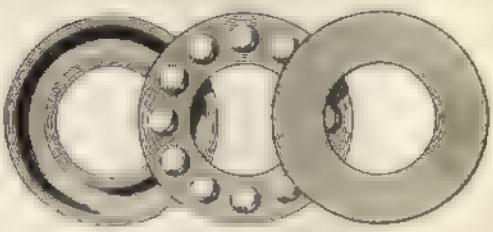
## Eclipse Coaster Brake

The largest makers and best dealers are using the ECLIPSE exclusively. Be sure it is on your mount.

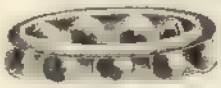
**Eclipse Machine Company, Elmira, New York**

## THE STAR BALL RETAINER CO.

Lancaster, Pa., U.S.A.



Complete Thrust Bearing



Radial Retainers

Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings, Special Stamping, etc.

# GEER MOTORCYCLES

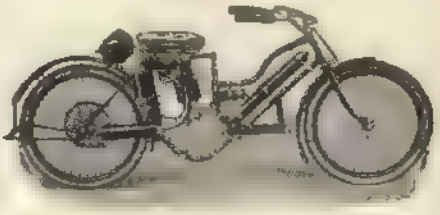
5-6 P 2-cylinder GEER Model 6 $225 00
4-5 P GEER Model 5 - - - 200 00
2½-3 H. P GEER Model 4 150 00
Used motor-cycles - - - 40 00

We have the largest line of new and used motor-cycles in the country at the lowest prices. Every machine guaranteed. Repairs a specialty. Motors and castings for air-ships. Motors for railway velocipedes. Send for catalogue.

HARRY R. GEER CO.
856 McLaran Ave. St. Louis, Mo.

# NEW ERA AUTO-CYCLE

TWO SPEEDS, FREE MOTOR, HAND-CRANKED MOTOR



**The New Era Gas Engine Company**
7 Dale Avenue, Dayton, Ohio

Standard Motorcycle Pedals

# Standard Motorcycle Parts

are invariably used by manufacturers of high-grade machines. They give that "quality touch" which helps to make sales.

## Standard Motorcycle Pedals

have deep corrugations which give a firm foot-hold and absorb vibration. The rubbers may be turned when worn, thereby giving new surfaces. STANDARD PEDALS are substantially and carefully made, and always give satisfaction.

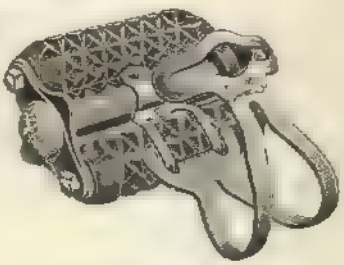
## Standard Sager Toe Clips

are the only ones which hold the foot securely, without undue pressure. They are strong and durable.

Write for prices on these and our complete line of Spokes and Nipples, Bridgeport and Star Pedals; also Breech Block Spark Plugs.

**The Standard Company**

**Torrington, Conn.**



Standard Sager Motorcycle Toe Clips

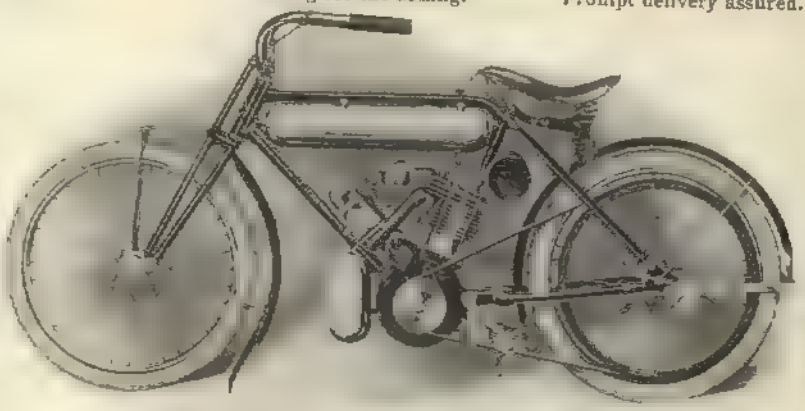
# *M. M. Motorcycles*

Have speed, all right, but speed isn't the first consideration in their construction. They are built for honest service and are noted for their simplicity, power, perfect construction, positive control and easy riding qualities.

You can ride as slow as you want, or you can travel one mile in sixty seconds with the

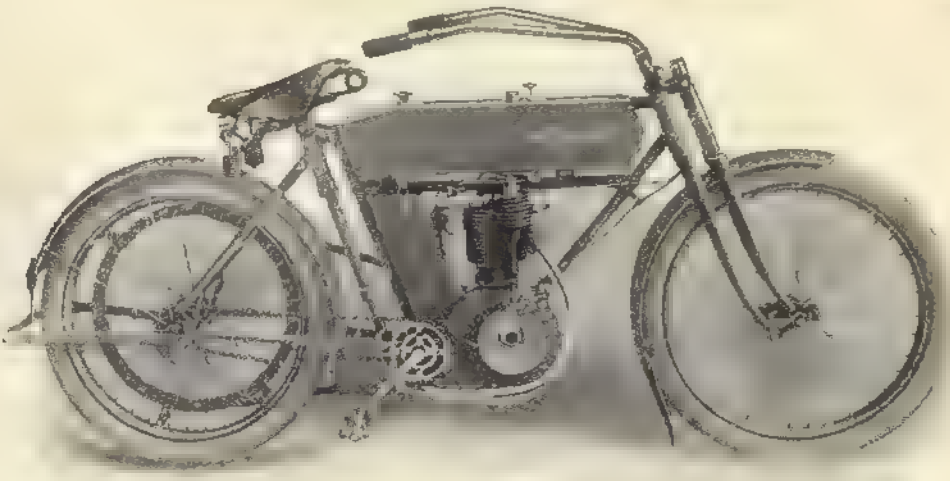
***SILENT M. M.***

Dealers wanted. Catalog for the asking. Prompt delivery assured.



**American Motor Company**

715 Centre Street, Brockton, Mass



# Now Then!

**We present the 1910 GREYHOUND with all the enthusiasm of the positive belief that it is the best and most efficient motorcycle of its class in the world!**

4½ H. P. — large fly wheel in aluminum case—combination tank for gasoline, batteries, coil and oil — double grip control — perfect oiling system — **GREYHOUND Patent Shock Absorber,** the finest comfort device ever applied to a motorcycle and a new cushion front fork that is equally good — all equipment of the best.

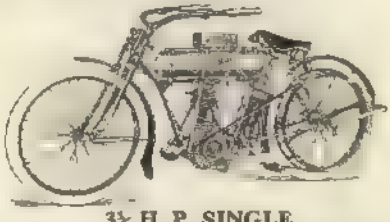
See it at Atlanta and other big shows. Catalog free. Interesting matter for good agents.

**GREYHOUND MOTOR WORKS :: 1453 Niagara St. :: Buffalo, New York**

Member Motorcycle Manufacturers Association

# 1910 YALE MOTORCYCLES
## ARE BEING DELIVERED

**6⅛ H. P. TWIN**
**S. G. V. belt. Bosch magneto, $300.**



**3⅝ H. P. SINGLE**
**Flat belt and idler, battery ignition, $200. S. G. V. belt optional. Herz magneto, $35 extra.**

¶ The Yale Motorcycle holds the **World's Record** for **Endurance,** and has **made good** in every test, no matter how severe.

¶ The Yale Motorcycle is operated at less **upkeep expense** than any other.

¶ The Yale Motorcycle is ideal for touring and business, because it runs **all the time** and is **free from trouble.**

¶ The Yale Motorcycle agency proposition for 1910 is very **attractive.**

**IMMEDIATE DELIVERIES. WRITE FOR INFORMATION**

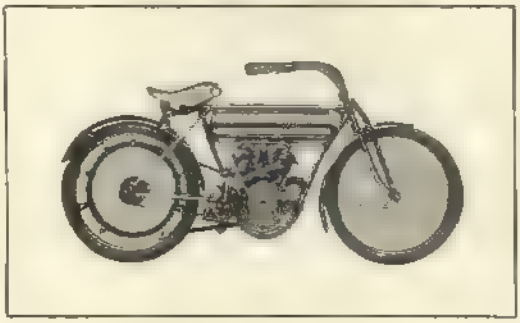
*Will exhibit Atlanta Auto. Show, November 6 to 13, space 84 E in basement*

**The Consolidated Mfg. Co., 1710 Fernwood Ave., Toledo, Ohio**

We also make Yale and Snell Bicycles, Consolidated Package Cars, Hussey Handle Bars and Drop Forgings of every description

# Merkel Comfort

SPRING FRAME



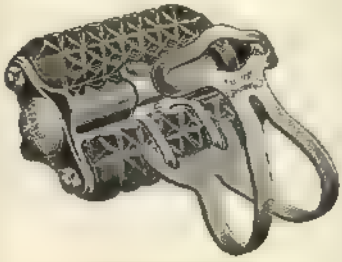
SPRING FORKS

**Fast :: Powerful :: Comfortable :: Reliable**

*That's what YOU want, Mr. Rider!*

**Merkel-Light Motor Co., Pottstown, Pa.**

Standard Motorcycle Pedals



Standard Sager Motorcycle Toe Clips

# The Majority is Usually Right

¶ **The test of time is always proof.**

¶ After many years **Standard Motorcycle Parts** have become known as **Standard** throughout the world, and they are found as high-grade equipments on the largest number of machines.

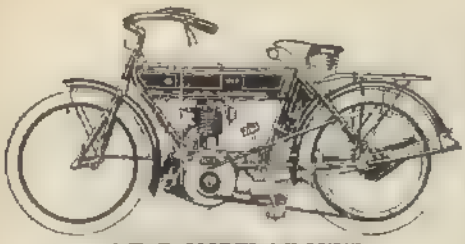
¶ **Standard Pedals** combine strength with lightness. The rubbers have deep corrugations which hold the foot firmly and absorb vibration. The rubbers may be turned, thus presenting new surfaces for wear.

¶ **Standard Sager Toe Clips** hold the foot securely without undue pressure. They are popular because comfortable, strong and neat.

¶ We also manufacture a complete line of **Spokes** and **Nipples, Bridgeport** and **Star Pedals,** on which it will pay you to get prices. The famous **Breech Block Spark Plug** is one of our products.

**The Standard Co., Torrington, Conn.**

# N. S. U. MOTORCYCLES
## THE WORLD'S BEST



4 H. P. MODEL DE LUXE

**FOR 1910**

The N. S. U. line will be the most complete and up-to-date Motorcycle line ever offered to the buying public. Our original lines will be continued, only to a greater extent than heretofore, and the imitators will still be 5 years behind.

**AGENTS**

It would be a wise move to look into our proposition. Do IT NOW" and write for catalogue "A" today.

**N. S. U. MOTOR COMPANY**
206 W. 76th Street New York City

# SIMPLICITY is a striking feature of the ECLIPSE COASTER BRAKE

and it is the simplicity which makes them so safe. As there are no intricate parts to get out of order at awkward moments. Be sure to see that the motorcycles you handle this season have the

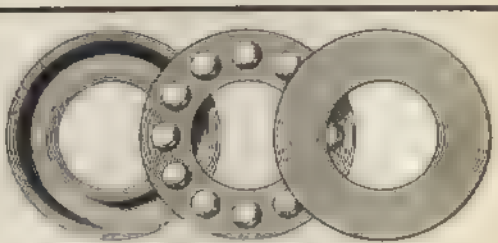
**Eclipse Coaster Brake**

It is the only one suitable for high-powered machines.

**Eclipse Machine Company, Elmira, New York**

# THE STAR BALL RETAINER CO.

Lancaster, Pa., U.S.A.



Complete Thrust Bearing

Radial Retainers

**Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings, Special Stamping, etc.**

# GEER MOTORCYCLES

5-H. P. 2-cylinder GEER MOTOR $225.00
4-H. P. ALBERMO - - - 200.00
2½-H. P. GEER Model 4 150.00
Used motor-cycles - - - 40.00

We have the largest line of new and used motorcycles in the country at the lowest prices. Every machine guaranteed. Repairs a specialty. Motors and castings for air-ships. Motors for railway velocipedes. Send for catalogue.

HARRY R. GEER CO.
856 McLaran Ave. St. Louis, Mo.

# NEW ERA AUTO-CYCLE

TWO SPEEDS, FREE MOTOR, HAND-CRANKED MOTOR

**The New Era Gas Engine Company**
7 Dale Avenue, Dayton, Ohio

# A $100 TYPEWRITER FOR 17 CENTS A DAY!

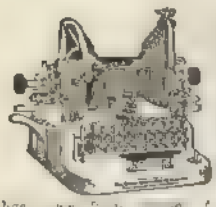
[illegible] will be needless ever again. Then its tremendous [illegible] now will [illegible] about it.

An Oliver Typewriter—the standard visible writer—the $100 machine the most highly perfected typewriter on the market—yours for 17 cents a day.

The speed for which [illegible] of the commercial world is a matter of [illegible] history—yours for 17 cents a day.

The typewriter that is equipped with scores of such conveniences as: The Balance Shift. The Ribbon Reverse. The Tabulator. Back Spacer. The Automatic Ribbon Vibrator. The Adjustable Spacer. The Variable Tabulator. The Disappearing Indicator. The Adjustable Paper Fingers. Scientific Concaved Keyboard, etc.

## Yours For 17 Cents a Day!



We announced this new sales plan recently, just to feel the pulse of the people. Simply a small cash payment, then 17 cents a day. That is the plan in a nutshell.

The result has been such a deluge of applications for machines that we are simply astounded.

The demand comes from [illegible] all classes, all ages, all stations.

The popularity of [illegible] has [illegible] shown by the standing with which it [illegible] by the quality of the product. As a progressive demonstration of the unique popularity of the Oliver Typewriter

A startling confirmation of our belief that the Era of Universal Typewriting is at hand

## A Quarter of a Million People are Making Money with

# The OLIVER Typewriter

*The Standard Visible Writer*

The Oliver Typewriter is a money maker, right from the word "go!" So easy to run that beginners soon get on the [illegible] as fast as you learn. Let the machine pay for 17 cents a day and all above that is yours.

Wherever you are [illegible] a work to be done and money to be made by using the Oliver. The [illegible] calling for Oliver [illegible] Users are not enough to supply the demand. Earnings are considerably above those of many classes of workers.

### "An Oliver Typewriter in Every Home!"

That is our battle cry to-day. We have made the Oliver supreme in usefulness and absolutely indispensable in business. Now comes the conquest of the home.

The simplicity and strength of the Oliver fit it for family use. It is becoming an important factor in the home training of young people. An educator as well as a money maker.

Our new selling plan puts the Oliver on the threshold of every home in America. Will you close the door of your home or office on this remarkable Oliver opportunity?

Write for further details of our easy offer and a free copy of the new Oliver catalog. Address

**The Oliver Typewriter Company**
**Walnut and Tenth Streets**
**Philadelphia, Pa.**

HERCULES

Port-able Crane Hoist

PATENTED DECEMBER 19 1905

See how easy it moves. Fills the bill for Automobile Factory and Garage Crane. Hundreds are using them. Stock sizes 1000 and 2000 pounds capacity. Larger made to order.

**William S. Nicholls, 252 Broadway, N. Y.**

# AUTOMOBILE BARGAINS!!

IN THE EAST, WEST NORTH, SOUTH

## The Times Sq. Auto Co.

[illegible] of the "Used Car" branch of the [illegible], announce the addition of another to their Branch Houses, this time at

# KANSAS CITY

**MAIN AND 17TH STREETS)**

where our policy of careful buying of none but good quality selling at only most reasonable profits and always giving our customers the benefit of our long experience that has made us so successful in

**NEW YORK, CHICAGO AND ST. LOUIS WILL BE CONTINUED**

This same policy, which we have maintained for ten years, has long since made us

**THE LARGEST DEALERS IN THE WORLD IN NEW AND USED CARS**

No matter what car you want, we have it and at prices lower than you could possibly buy elsewhere

Communicate with us before deciding, in person or by mail; it will pay you.

**THE TIMES SQUARE AUTOMOBILE BULLETIN**

will be of value and interest to you whether an owner or prospective buyer of a car. It is published monthly. Contains live auto matter described and gives prices on over 300 cars, every one a bargain. Single copies free.

**DEAL WITH A RESPONSIBLE HOUSE**

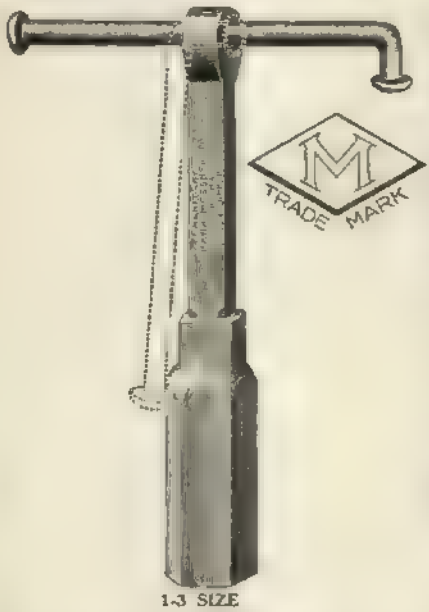
# Times Sq. Auto Co.

**NEW YORK, 215-17 West 48th St.**

| CHICAGO | ST. LOUIS | KANSAS CITY |
|---|---|---|
| 1332-1334 Michigan Ave. | Cor. Pine & 18th Sts. | Main and 17th Streets |

If Your Tool-Kit Doesn't Contain a **Frank Mossberg Co.'s**

# SOCKET WRENCH




1-3 SIZE
Patent applied for

make haste to repair that omission at once. No more handy or convenient wrench has ever been placed on the market for automobiles, motor boats, gas engines, pumps and other light machinery

With the **Socket Wrench** you can reach places inaccessible with any other form. The handle folds down as shown, so that the wrench takes up but little room in a tool-kit.

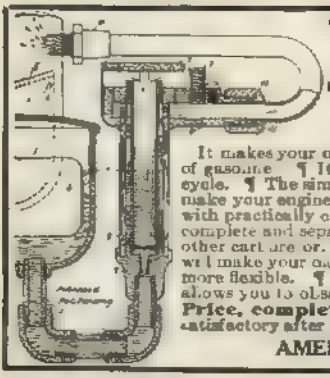
Any required assortment of sockets furnished A special 4-inch one makes the wrench particularly adapted for the removal or insertion of spark plugs. No need of burning the fingers when handling hot spark plugs.

Write for prices and full particulars.

## Frank Mossberg Co.

ATTLEBORO, MASS.

**45 Lake St., Chicago**
**132 Valencia St., San Francisco**



## The Weiland Supplementary Carburetor

**Attach it to your old carburetor and it will give you the following great improvements:**

It makes your old carburetor absolutely self-priming without waste of fuel or dripping of gasoline. ¶ It starts your cold motor even in freezing weather on the first complete cycle. ¶ The simple closure (not opening) of the throttle on stopping your motor will make your engine almost sure of starting on the spark. ¶ It allows your motor to start with practically closed throttle, thus preventing any racing on starting. ¶ It acts as a complete and separate carburetor for slow speed and will run your engine slower than any other carburetor. ¶ It will make your engine pull better on hills and at slow speed. ¶ It will make your old carburetor 10 to 20% more economical. ¶ It will make your motor more flexible. ¶ It will indicate the level of the gasoline in the float chamber and also allows you to observe the thorough vaporization of the fuel when the engine is running. **Price, complete with fittings, $6.00. Agents Wanted.** Money refunded if not satisfactory after ten days' trial. Write for circular

AMERICAN DIE & TOOL COMPANY, READING, PA.

## Seamless Brass and Copper Tube for conducting oil or gas for Radiators, etc.
## Small sizes a specialty
## Arthur T. Rutter & Co., 256 Broadway, N. Y. City

# COMMERCIAL POST CARDS

**IN NATURAL COLORS,** made to order to suit your requirements Make good ads, at reasonable prices. Send us pieces of your printed matter, but ask for SAMPLES and PRICES.

**CHILTONN PRINTING COMPANY, Market & 49th Sts., PHILADELPHIA**

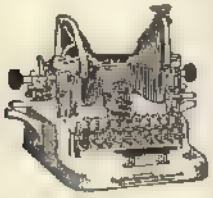
# A $100 Typewriter for 17 Cents a Day!

Please read the headline over again. Then its tremendous significance will dawn upon you

An Oliver Typewriter—the standard visible writer—the $100 machine—the most highly perfected typewriter on the market—*yours for 17 cents a day!*

The typewriter whose conquest of the commercial world is a matter of business history—*yours for 17 cents a day!*

The typewriter that is equipped with scores of such conveniences as "The Balance Shift"—"The Ruling Device"—"The Double Release"—"The Locking Base"—"The Automatic Spacer"—"The Automatic Tabulator"—"The Disappearing Indicator"—"The Adjustable Paper Fingers"—"The Self-Cleaning Condensed Keyboard"—and all



## Yours for 17 Cents a Day!

We announced this new sales plan recently, just to feel the pulse of the people. Simply a small cash payment—then 17 cents a day. That is the plan in a nutshell

The result has been such a deluge of applications for machines that we are simply astounded

The demand comes from people of all classes all ages, all occupations

The majority of inquiries has come from people of known financial standing who were attracted by the novelty of the proposition. An impressive demonstration of the immense popularity of the Oliver Typewriter.

A startling confirmation of our belief that the Era of Universal Typewriting is at hand

## A Quarter of a Million People are Making Money with

## The OLIVER Typewriter

*The Standard Visible Writer*

The Oliver Typewriter is a money-maker, *right from the word "go!"* So easy to run that beginners soon get in the "expert" class. *Earn* as you *learn*. Let the machine pay the *17 cents a day*—and all *above* that is *yours*

Wherever you are, there's work to be done and money to be made by using the Oliver. The business world is calling for Oliver operators. There are not enough to supply the demand. Their salaries are considerably *above* those of many classes of workers

## "An Oliver Typewriter in Every Home!"

That is our battle cry today. We have made the Oliver *supreme in usefulness* and absolutely *indispensable* in *business*. Now comes the conquest of the home

The simplicity and strength of the Oliver fit it for family use. It is becoming an important factor in the home training of young people. An *educator* as well as a *money* maker

Our new selling plan puts the Oliver on the threshold of every home in America. Will you please call door of your home or office on this remarkable Oliver opportunity

Write for further details of our easy offer and a free copy of the new Oliver catalog. Address

**The Oliver Typewriter Co.**
**Walnut and Tenth Streets, Philadelphia**



# The most complete directory of the automobile industry is the

## MOTOR CYCLE, MOTOR BOAT & AUTOMOBILE TRADE DIRECTORY

(Published in Philadelphia—Quarterly)

**January, April, July and October**

IT CONTAINS

**A complete and accurate** classified list of all the manufacturers of Motor Cars, Motor Cycles, and Motor Boats and their parts and accessories.

**A complete alphabetical** register of brands of Motor Cars, Motor Cycles and Motor Boats and their parts and accessories.

**A complete classified** list of makers of machinery and tools for automobile manufacturing and repairing and shop equipment generally.

**List of trade** associations and club organizations with names of officers and other particulars.

**Engineering data** and tables for the use of the manufacturer and repairman.

**Useful formulas** and recipes.

**Helpful Electrical Data.**

**Automobile Insurance.**

**Digest of Automobile Laws** of various states, etc., etc., etc.

| | |
|---|---|
| Single copies, | $0.50 |
| Quarterly, one year, | 1.00 |
| " five years, | 4.00 |

**Sample copies sent free** to anyone connected with the industry on request written on business stationery.

## Chilton Printing Co.

**Market and 49th Streets, W. Phila.**

# Overland

## THE CAR WITH THE RECORD BUILT IN

The man who buys an Overland does not carry his car's record in name only he has the record built right into his own individual machine.

He can be sure that the past service records of Overland cars, which prove a service worth in every respect equal to that of any car, regardless of price, are certain to be duplicated by the Overland he himself buys.

Every one of the thousands of Overland cars now in active service is demonstrating its ability to carry a given load farther at less expense than any other motor car made.

**Every Overland is doing duty on the road. Every one is keeping out of the repair shop. Every one is giving its owner everything he can desire in the way of style, speed, service and satisfaction. You can pay more and get less—but you can't get an abler car at any price.**

### MODEL 38

24 Horsepower. Planetary transmission, 2 speeds forward, 1 reverse. Roadster body, Single or double bucket; 2, 3 or 4 passengers. Price, $1050.

### MODEL 40

32 Horsepower. Planetary transmission, 2 speeds forward, 1 reverse. Roadster body, Single or double bucket; 2, 3 or 4 passengers. Price, $1250.

### MODEL 41

32 Horsepower. Planetary transmission, 3 speeds forward, 1 reverse. Close coupled body, or 5 passenger touring, 4 or 5 passengers. Price, $1400.

### MODEL 42

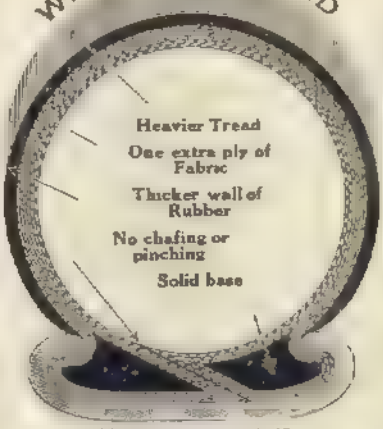
32 Horsepower. Sliding gear transmission, 3 speeds forward, 1 reverse. Close coupled body, or 5 passenger touring 4 or 5 passengers. Price, $1500.

**Choice of bodies with any of these models. Have our nearest dealer demonstrate the Overland for you. You'll wonder why any car costs more**

OVERLAND AUTOMOBILE COMPANY, TOLEDO, O. INDIANAPOLIS, IND.

*Standard Mfrs., A. M. C. M. A.*

POPULAR WRAPPED-TREAD




NO LUGS OR BOLTS

EXCLUSIVE FEATURES
HIGH QUALITY

# STEIN

## PNEUMATIC AUTO TIRES

## A "TEST"

BETWEEN **"A STEIN"** AND ANY OTHER TIRE **"ON YOUR OWN CAR"** WILL TELL THE STORY

*WRITE FOR BOOKLETS AND PRICES*

THE STEIN DOUBLE CUSHION TIRE CO.
AKRON, OHIO

# Pickard

MANUFACTURERS

MODEL E $750

"A LOT OF CAR FOR THE MONEY"

If you are looking for a runabout to handle next season, you cannot choose a better seller than the PICKARD. Although the price is low the quality is high. Made in the following models.

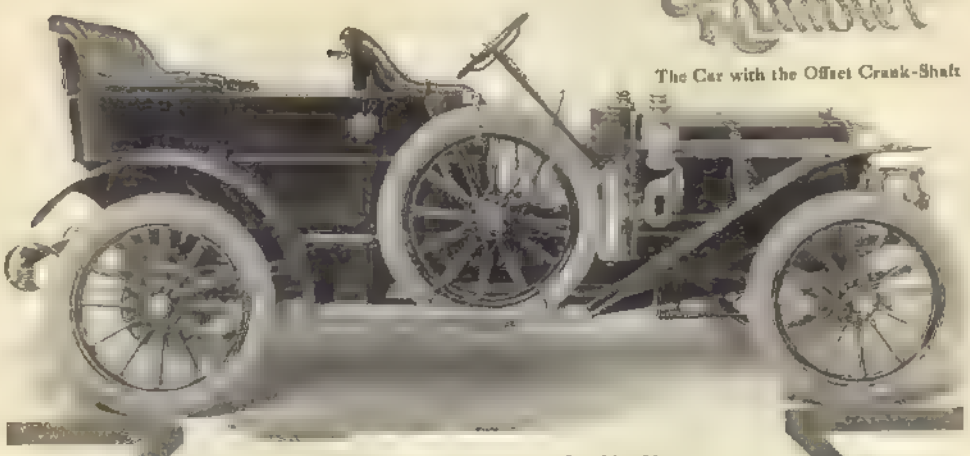
**Rumble Seat, Model F, $800; Touring Car, Model H, $850; Surrey, Model G, $825; Model A, $1400; Model B, $1200; Model C, $1450; Model D, $1600.**

FULL PARTICULARS ON REQUEST

PICKARD BROS. BROCKTON, MASS.

Rambler

The Car with the Offset Crank-Shaft



Model Forty-four, 34 H. P. $2,250.

Spare Wheel, with Inflated Tire, Brackets, and Tools, $74. Magneto, $150.

## *Quality in the Rambler*

That quality of refinement in workmanship and material which dominates every detail of the new Rambler is most apparent when it is compared, part for part, with cars costing hundreds and thousands of dollars more.

The perfection of every detail in the making of this automobile can be attributed to that infinite care and pride in his work which every Rambler mechanic brings to his individual task. The selection, indifferent to cost, of the materials used and the finished skill applied to fashioning each part stamps the Rambler as a car of character.

The Rambler Spare Wheel, Offset Crank-Shaft and other exclusive Rambler features are but evidences of our constant effort to provide for the comfort and satisfaction of Rambler owners.

May we send you the new Rambler catalog, or a free copy of the Rambler Magazine, monthly publication for owners? Rambler automobiles $1,150 to $2,500.

## *Thomas B. Jeffery & Company*

**Main Office and Factory, Kenosha, Wisconsin.**

*Branches and Distributing Agencies:*

Chicago Milwaukee Boston Cleveland New York San Francisco. Representatives in all leading cities.

Thomas B. Jeffery & Company, Main Office and Factory, Kenosha, Wis.
*Branches and Distributing Agencies:* Chicago, Milwaukee, Boston, New York, Cleveland, San Francisco

*"Giant's Despair" Mountain Conquered at Last by a Single Cylinder Motorcycle. The R-S is the First and Only Single Cylinder Motorcycle that Ever Accomplished this Wonderful Feat.*

On May 31st, 1909, at Wilkes-Barre, Pa.

## The R-S Single Cylinder Model 2

Regular 4 H.P. Stock Machine,
Ridden by its Owner,

**Easily Negotiated "Giant's Despair Wilkes-Barre Mountain," Time, 2:28**

[illegible]

**THE R-S is the only MOTORCYCLE**
**THAT EVER CLIMBED PIKE'S PEAK**

**THE R-S IS STILL THE KING OF HILL CLIMBERS**

Built and Tested in the Mountains — **AMERICA'S BEST** — No Limit to Speed But the Law

**Reading Standard Co., Reading, Pa.**
DEPARTMENT C

*"Giant's Despair" Mountain Conquered at Last by a Single Cylinder Motorcycle. The R-S is the First and Only Single Cylinder Motorcycle that Ever Accomplished this Wonderful Feat.*

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[illegible]

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## THE R-S IS STILL THE KING OF HILL CLIMBERS

Built and Tested in the Mountains { AMERICA'S BEST } No Limit to Speed But the Law

## Reading Standard Co., Reading, Pa.

DEPARTMENT C

Good companions

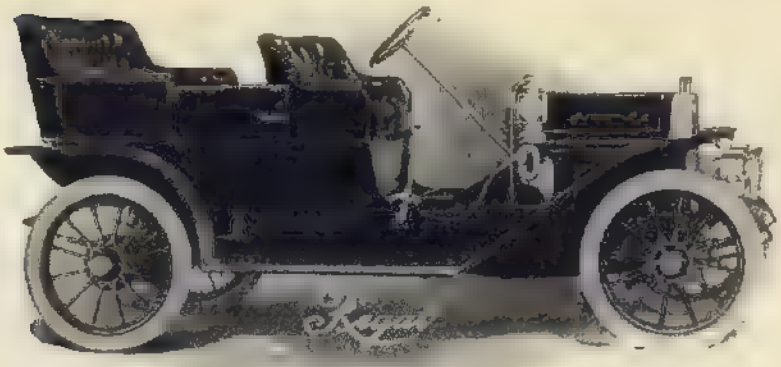
for your touring trip

Red Head

Every dealer in America now sells the RED HEAD PLUG.

Emil Grossman Company

232 WEST 58TH STREET
NEW YORK CITY



MODEL A—5 PASSENGER TOURING CAR

# REGAL 30

## With Magneto

## $1,250.00

**Regal Models** are noted for their neatness in **Design** and **Simplicity** in construction. Also for their **Reliability** and **Durability.**

**DEALERS:**—We are making contracts now for 1910 business. Owing to the fact that so many dealers have not received cars from the various companies contracted with in 1909, we are in position to submit our 1910 agency proposition insuring prompt deliveries for next season. Write for our 1910 agency proposition now

### Specifications

Four Cylinder, 30 Horsepower. Four-Passenger, Detachable Baby Tonneau or Five-Passenger Touring, Selective Type Sliding Gear Transmission. Three Speeds and Reverse, Cone Clutch, Weight, 1,900 lbs., Wheel Base 105 ins., Speed 55 miles per hour, Magneto Equipment, 32 in. x 3½ in. Tires. Price, $1,250.00.

### Cut This Out

Please send us your 1910 Agency Proposition.

Name.. . . . . .

. . . . . .

. . . . . .

Address . . . . . .

. . . . . .

. . . . . .

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**REGAL MOTOR CAR CO. - DETROIT, MICH.**

# Regal "30"
# $1250

## Low Price & High Quality

THE FIRST 4-cylinder car on the market at $1250. THE FIRST to demonstrate to the American public the reliability and durability in the mid-winter runs and hill climbs that this wonderful car has entered into.

**Live Dealers Notice**

**We have a little unassigned territory. If you are looking for a line that will sell on sight, write us today for our agency proposition.**

THE CAR THAT HAS MADE GOOD. EVERY PART OF REGAL CARS machined and assembled in our own shops.

*Do you want illustrated booklet on the famous run of the Regal "30" Snow Ball Limited? If so send us postal today for one; also catalog specifications.*

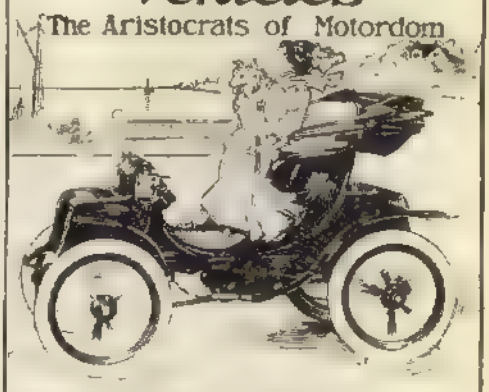
**Specifications of Model "A" and Model "B"**

Model "A"—Five-passenger Touring Car
Model "B"—Three or Four-passenger Runabout.
Horsepower—30.
Engine—4-cylinders, 4-cycle, Vertical type.
Crankshaft—Single piece forging, especially heat-treated, large bearings with flywheel, flange forged integral on crankshaft.
Transmission—Selective type sliding gear. The entire transmission is operated on ball bearings.
Speeds—Three forward and one reverse, direct on high speed.
Shaft Drive.
Steering Gear—Irreversible. Worm and Sector type.
Wheel Base—105 inches.
Lubrication—Circulating and Splash System.
Ignition—Dual System, consisting of Remy High-Tension Magneto with distributor and single non-vibrating coil on dash, also set of batteries with double-throw switch on coil.

**Regal Motor Car Co.**
**Hastings St., Detroit, Mich.**

# Baker Electric Vehicles

The Aristocrats of Motordom



BAKER ELECTRICS have given the electric vehicle industry its reputation.

The great Baker factory, devoted exclusively to the manufacture of Baker Electric Vehicles, is the largest of its kind in the world, and employs the most eminent experts in every department of construction.

Baker Vehicles are the height of excellence in equipment, appointments, luxurious furnishings, and that unusual care to details, which makes them the most extraordinary cars in durability, and mileage capacity.

## A Few Baker Features Are

*Unequaled economy in the use of Electric Current.*
*Batteries in series at all speeds.*
*Longest life of the battery.*
*Quiet center-chain drive.*
*Perfect alignment under all conditions.*
*Lowest transmission loss.*
*Exide batteries standard equipment.*

These and many other points of superiority make the Baker the standard of electric vehicles.

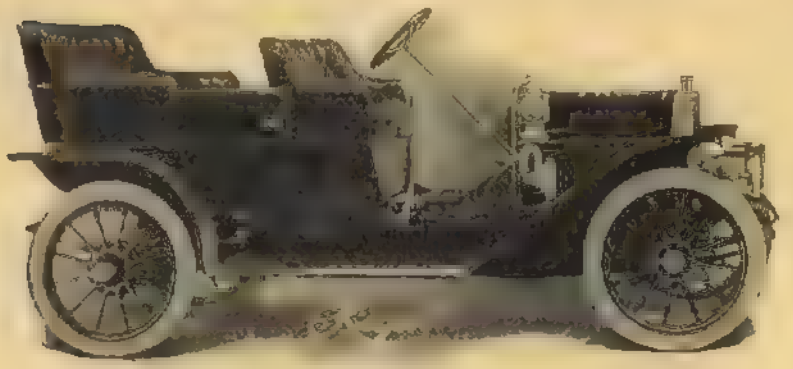
## We Want Reliable and Progressive Agencies

in every city where we are not already represented. **Send for Catalog** describing the many popular Baker Models:

Gentleman's Runabout—(*The electric sensation of 1909.*)
Lady's Coupé—(*roomy four passenger car.*)
Queen Victorias, Landaulets, Broughams, Surreys and Commercial vehicles.

**Baker Motor Vehicle Company,**
**35 W. 80th Street, Cleveland, Ohio.**

New York Salesroom, 1188 Broadway.
Chicago Salesroom, 1714 Michigan Av.



MODEL E—BABY TONNEAU

# REGAL 30

## With Magneto

## $1,250.00

**Regal Models** are noted for their neatness in **Design** and **Simplicity** in construction. Also for their **Reliability** and **Durability.**

**DEALERS:**—We are making contracts now for 1910 business. Owing to the fact that so many dealers have not received cars from the various companies contracted with in 1909, we are in position to submit our 1910 agency proposition insuring prompt deliveries for next season. Write for our 1910 agency proposition now

**Specifications**

Four Cylinder, 30 Horsepower, Four-Passenger, Detachable Baby Tonneau or Five-Passenger Touring, Selective Type Sliding Gear Transmission. Three Speeds and Reverse, Cone Clutch, Weight, 1,800 lbs., Wheel Base 105 ins., Speed 55 miles per hour, Magneto Equipment, 32 in. x 3½ in. Tires. Price, $1,250.00.

**Cut This Out**

Please send us your 1910 Agency Proposition.

Name. .

Address . .

**REGAL MOTOR CAR CO. - DETROIT, MICH.**

"Aplco" Volt Ammeter

"Aplco" Dynamo

# You CanElectric Light All Lights, Including the Powerful Headlights, with the "Aplco" Automobile Electric Lighting and Ignition System. This is the First and Only System that will Furnish Sufficient Current for Doing It Properly from the Engine's Own Power.

¶ The "Aplco" Dynamo is positively driven and is so built that it can be driven from the drive now provided generally for driving the ignition magneto.

¶ Specify on your new car or advise us the make and model of your car and we will quote you on the system complete.

¶ "Aplco" Storage Batteries are the first and only portable storage batteries made that are absolutely acid proof outside as well as in. They can be kept submerged for any length of time in acid without injuring a single part about them.

¶ Write for Bulletins Nos. 4 and 8, which describe our line

"Aplco" Storage Battery

## Apple Electric Company

No. 20 North Canal Street
DAYTON, OHIO, U. S. A.

Load Regulator and Cut-Out

**Made in Detroit——————Runs Everywhere**

# "Regal 30"

## Champion of Real Test

## This is Certainly POSITIVE PROOF of Power and Endurance

# REGAL PLUGGER

**LEFT NEW YORK CITY JULY 7th—ARRIVING SAN FRANCISCO AUG. 12th. DISTANCE, 4,387 MILES**

**The first moderate-priced car to ever attempt and finish a run of this kind**

TELEGRAM

San Francisco, Aug. 12, 1909.

"REGAL PLUGGER" reached San Francisco today, completing 4,387 miles transcontinental trip in perfect condition. Accorded great reception.

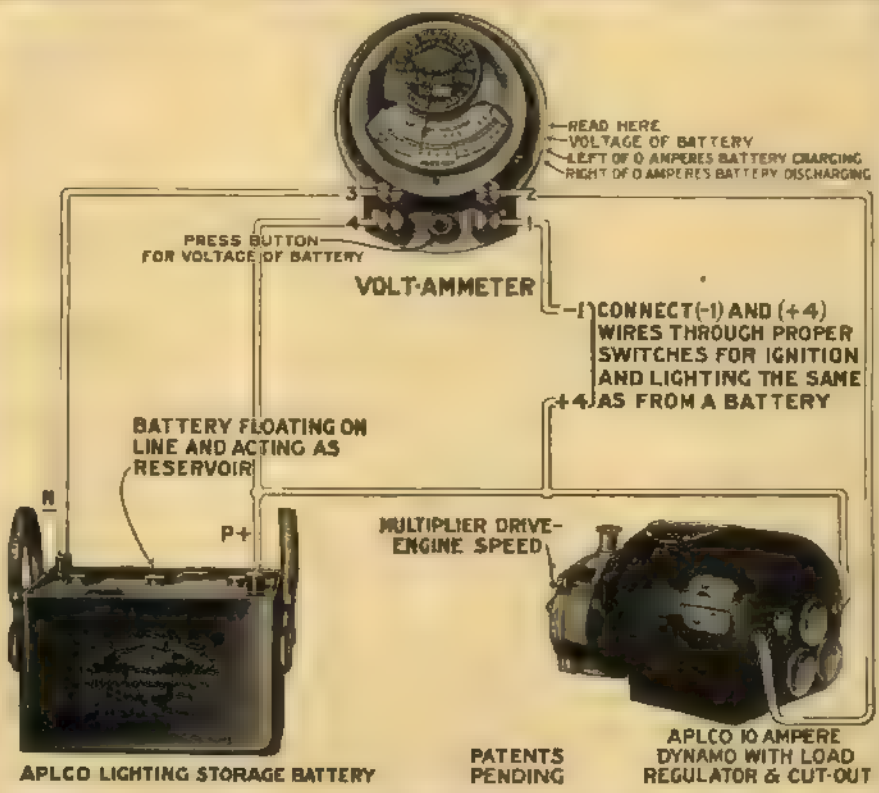
GEORGE D. WILCOX.

4 Cylinder
30 Horsepower **$1250** Magneto and full Lamp Equipment included

**WRITE FOR BOOKLETS TODAY**

**REGAL MOTOR CAR CO., Detroit, Mich.**

# An Automobile Improvement Which Makes It Safer, Simpler and More Economical




The latest and most novel use to which electricity has been put in the last year or two is for electric lighting, in addition to igniting gasoline automobiles, as is now accomplished by the "Aplco" Electric Lighting System for automobiles as has recently been perfected by V. G. Apple and his corps of engineers and mechanics.

The "Aplco" System eliminates flame with its fuel of coal oil and acetylene entirely from the car.

The "Aplco" System saves the cost of coal oil, carbide and having batteries and gas tanks continually recharged in addition to the time saved.

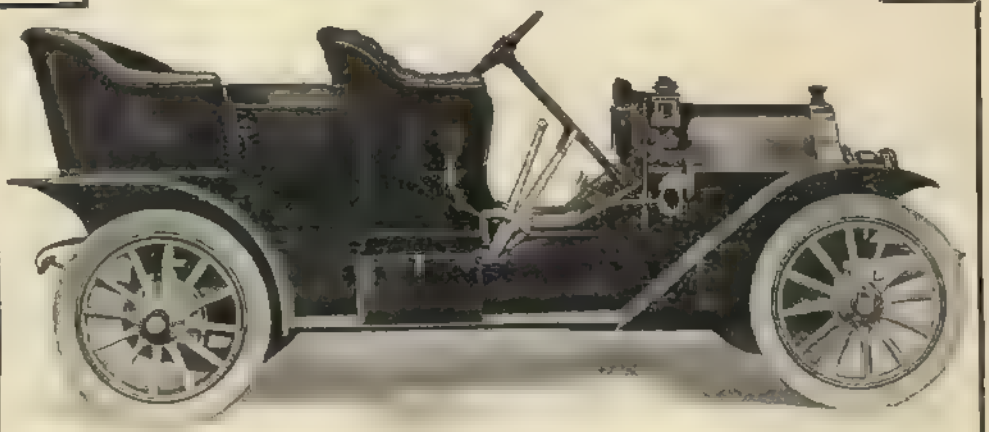
The "Aplco" System replaces dry batteries, vibrator coils troublesome timers, magneto, gas tank or acetylene generator, coal oil, acetylene gas, carbide oil lamp fixtures, gas lamp fixtures, matches, loss of time stopping car to light and regulate acetylene gas, as with the electric system it is all done by switches from the seat at will.

Besides the greater convenience of an electric lighted auto the light which is whiter and stronger, will be projected farther than is now possible with the acetylene headlights now commonly in use. The electric lighting of automobiles, in addition to being more convenient, is much more economical, as it saves the total cost of oil, carbide or acetylene and the expense, trouble and annoyance of having batteries and gas tanks continually recharged.

Can be installed on any machine. Send for descriptive booklet. Agents wanted in unoccupied territory.

**APPLE ELECTRIC COMPANY,** 20 N. CANAL STREET DAYTON, OHIO, U. S. A.

# RIDER-LEWIS



**Type IV Touring Car**

## THIS IS THE CAR

¶ The new RIDER-LEWIS TYPE IV car is out and creating a furor among agents.

¶ If you have not seen it get in line at once and secure the address of our nearest distributor.

¶ Nothing like it has been seen for a decade.

¶ Marks the era of the popular priced four cylinder car.

¶ Handsome and dependable; an ideal family car has at last been produced for the man of moderate means.

¶ Other low priced cars are being offered, but the RIDER-LEWIS is the first real touring car at the price.

## NOTE SPECIFICATIONS

| | |
|---|---|
| MOTOR: | 4 cylinder, 30 Horse Power, cast en-bloc, 4" x 4½". |
| VALVES: | Overhead valves, extra large. |
| COOLING: | Thermo-syphon system of ample proportions. |
| CONTROL: | Pedal controls clutch; selective gear shift; spark and throttle quadrants on wheel. |
| SPRINGS: | Semi and scroll elliptic. |
| FRONT AXLE: | Latest design "I" beam. |
| REAR AXLE: | Three-speed selective transmission integral. |
| WEIGHT: | About 1700 lbs. |
| PRICE: | Lamp equipment and Remy Magneto |

**$1050 f. o. b. Anderson, Ind.**

**Rider-Lewis Motor Car Co., Anderson, Ind.**

EASTERN DISTRIBUTORS:
H. J. Koehler Sporting Goods Co., 1709 Broadway, New York City

Robert Burman, winner of the 100-mile race at New Orleans, 100-mile race at Columbus and other big contests in Buick, equipped with Remy. He is shown driving at 60 miles an hour.

# "Remy Magneto the Greatest Made"

—*Robert Burman*

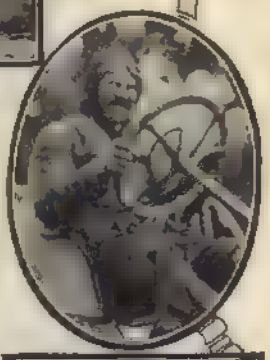
Lowell, September 6, 1909.

Remy Electric Company,
Anderson, Indiana.

Gentlemen:

I won the 212-mile race at Lowell to-day with a REMY Magneto, and, as usual, did not know what a moment's ignition trouble was. Besides winning the race, I also covered the fastest lap of the day, doing the ten and six-tenths miles in ten minutes and twelve seconds, conclusively proving that the REMY Magneto is the greatest magneto made at high as well as low speed. I cheerfully recommend REMY Magnetos to all drivers of automobiles.

Yours respectfully,
(Signed) ROBERT BURMAN.



# Over 100,000 Remy Magnetos Sold for 1910

Not one quantity user who helped make our immense 1909 season has failed to adopt the REMY for 1910. Besides—many manufacturers have adopted the REMY for 1910 who formerly used other magnetos.

Our factory is the largest and best equipped plant in the world devoted exclusively to magneto manufacturing.

## Remy Electric Company

**Dept. 13**

**Anderson, Indiana**

**BRANCH DISTRIBUTING OFFICES:**

1400-1402 Michigan Avenue
CHICAGO

Automobile Bldg., 64th St. and Broadway
NEW YORK CITY

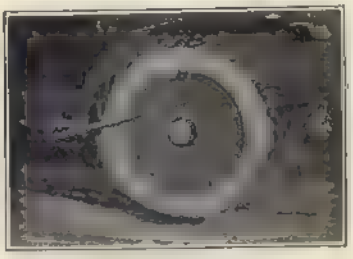
471 Woodward Avenue
DETROIT

406 East 15th Street
KANSAS CITY

SAN FRANCISCO

***Remy Magnetos—chosen by the great drivers for their equipment***

# LET YOUR CAR DO THE WORK



THE PUMP IN DETAIL

WITH

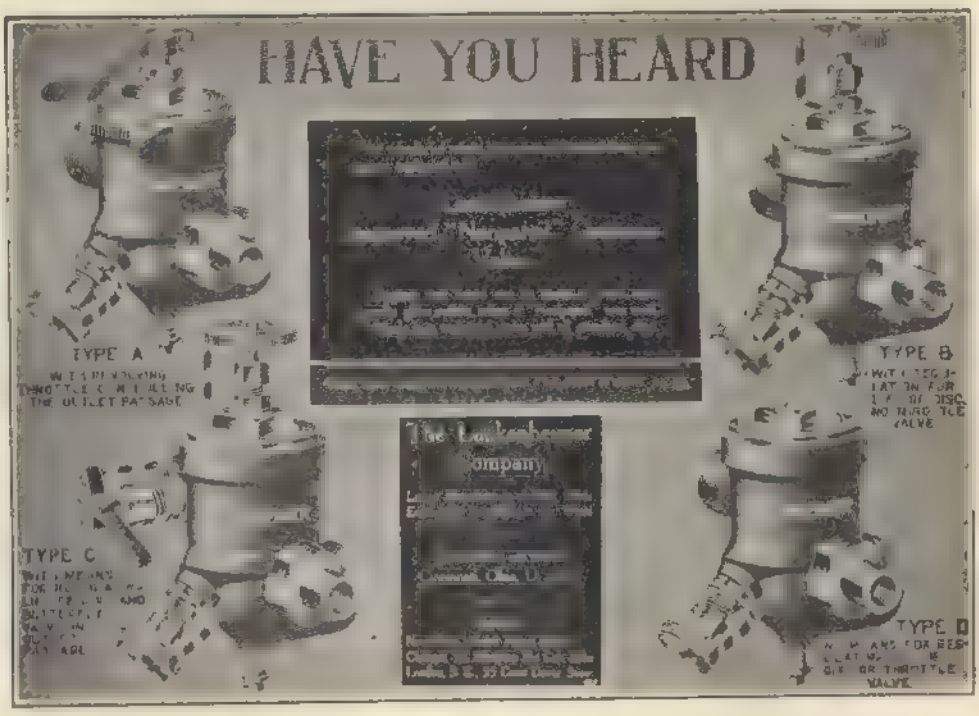
## The RUNG AUTOMATIC TIRE PUMP

You can inflate your automobile tire in less than two minutes, through the car's own power. Can be operated at any speed. Isn't this an improvement over the use of a hand pump?

### OUR GUARANTY

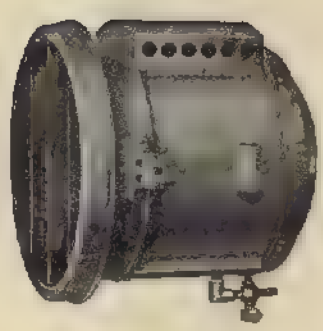
If the pump does not do all that we claim for it, return it within thirty days and your money will be refunded. Write for illustrated booklet.

**THE RUNG AUTOMATIC TIRE PUMP CO.**
**200 Girard Trust Bldg., Philadelphia, Pa.**
**SKINNER & SKINNER CO., Chicago, Western Distributors**



# SIMPLICITY=DIGNITY=TRUE WORTH

"Who ever heard of Queen Alexandra changing the shape of her hat?" Thus queried lately a French critic, contrasting the simplicity of cultured taste with the shifting monstrosities of modern modes.



Who ever heard of a true artist taking liberties with his subject? The Thing Which Is, Endures; the Thing Which Is Not, passes away.

## RUSHMORE SEARCHLIGHTS

are optically the best, mechanically the strongest and most durable in the world. Their outward form is the fit and dignified expression of their inward worth.

## RUSHMORE DYNAMO WORKS

PLAINFIELD, NEW JERSEY

CHICAGO, ILL. LONDON PARIS

# Worth=Present and Future

The experienced buyer of motor cars no longer questions the wisdom of buying a *manufactured* car. He knows that a price—high or low—does not establish the real character of any assembled car.

In making his choice between cars which he *knows* are manufactured cars, he should consider both the *kind* of manufacture and the *stability* of the maker, because a motor car has a future as well as a present.

The factory behind the Marmon car has had over fifty years' experience in the manufacture of high-grade machinery. Its product has a well-established reputation in every quarter of the civilized world

It is easy to see why the Marmon should be exactly what it is—a car of marked mechanical perfection, sound, careful construction and great durability

The abundant value in the "Thirty-two" is readily apparent to anyone who knows the kind of design, materials, workmanship and equipment that distinguish a really high-grade car.

From every standpoint, it is the safe choice for any perplexed buyer.

## Price, Complete {Touring Car, Suburban or Roadster} $2650

**SPECIFICATIONS**—**Motor,** four cyl. 4½x5, 32-40 H P water cooled, with Mercedes type honeycomb radiator **Ignition,** Imported Bosch H T Magneto and battery, dual system **Lubrication,** Marmon system of automatic force feed through hollow crankshaft **Drive,** straight line shaft Selective transmission and floating rear axle one compact unit Large durable brakes easy adjustment **Materials,** absolutely the best of everything including Krupp, Vanadium and Chrome Nickel steels, Imported Hess-Bright bearings Schwarzwaelder **Tires,** 34x4 Q D Marsh Kuma **Wheel Base,** 116 inches Weight (Touring Car), 2300 lbs. **Bodies,** aluminum cast aluminum base with cast aluminum doors and door frames **Equipment,** complete and highest grade

*DEALERS who wish to figure on an agency for the best, moderate-priced, high-class car, should write us at once.*
*Promised deliveries easily made good.*

**Nordyke & Marmon Co.** (Estab. 1851) **Indianapolis, Ind.**

*Standard Mfrs., A. M. C. M. A.*

*"Giant's Despair" Mountain Conquered at Last by a Single Cylinder Motorcycle. The R-S is the First and Only Single Cylinder Motorcycle that Ever Accomplished this Wonderful Feat.*

**On May 31st 1909, at Wilkes-Barre Pa.**

## The R-S Single Cylinder Model 2

**Regular 4 H.P. Stock Machine, Ridden by its Owner,**

## Easily Negotiated "Giant's Despair Wilkes-Barre Mountain," Time, 2:28

None but special or high powered twin cylinder machines have ever climbed this mountain. In this event the competing motorcycle had a specially built twin cylinder motor provided with auxiliary exhaust ports, and was stripped of equipment and ridden by an acknowledged expert rider with previous experience, while the R-S rider-owner rode his machine fully equipped and had no previous experience whatever.

## THE R-S is the only MOTORCYCLE THAT EVER CLIMBED PIKE'S PEAK

## THE R-S IS STILL THE KING OF HILL CLIMBERS

Built and Tested in the Mountains { AMERICA'S BEST } No Limit to Speed But the Law

## Reading Standard Co., Reading, Pa.

DEPARTMENT C

All Alike but STEIN LAPLOCK TIRES

# The Laplock Base Has Selling Advantage Over All Others

All Alike but STEIN LAPLOCK TIRES

Stein Tires are tires that every dealer needs to keep in stock. The Laplock Base gives them a distinct advantage with every buyer.

No other tire has a solid wall between the rim and inner tube.

No other tire gives absolute protection to the inner tube from "pinching," "chafing" and rotting.

In selling any other tire you can only talk glittering generalities about quality. The Stein Laplock Tire has quality equal to any and *The Stein alone has the Laplock Base*

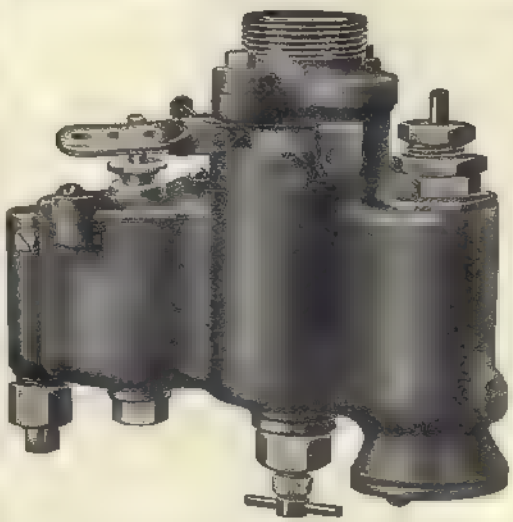
**The Stein Double-Cushion Tire Co.**

**Do not delay. Write at once for Booklet "T" and prices.**

AKRON, OHIO

Established 1901

# The Sherwood "Model K" Carburetor



## Has Three Jets,

**each in a separate mixing chamber and all controlled by one throttle.**

## Power--Flexibility

## Perfect Motor Control

## and Economy are

## the Results and

**One Gasolene Adjustment Does It**

*Write for Circular Giving Full Information.*

**Manufactured by**

**Sherwood Manufacturing Co., Buffalo, New York**

Standard Motorcycle Pedals

# Standard Motorcycle Parts

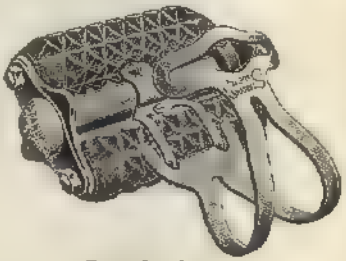
have for years been the choice of those manufacturers who appreciate quality and good service, and who are anxious to give their customers the highest grade equipment. Two of the most popular are illustrated,—

## The Standard Pedal and Standard Sager Toe Clip.

The **Standard Pedal** has deep corrugations in the rubber which give a firm foot-hold and absorb vibration. The rubbers may be turned when worn.

**Standard Sager Toe Clips** hold the foot securely without great pressure. They are substantially made and carefully finished.

It will pay you to get prices on our complete line of Spokes and Nipples; Bridgeport and Star Pedals; also Breech Block Spark Plugs.



Standard Sager Motorcycle Toe Clips

**The Standard Company**
**Torrington, Conn.**

# THE SILENT M. M.

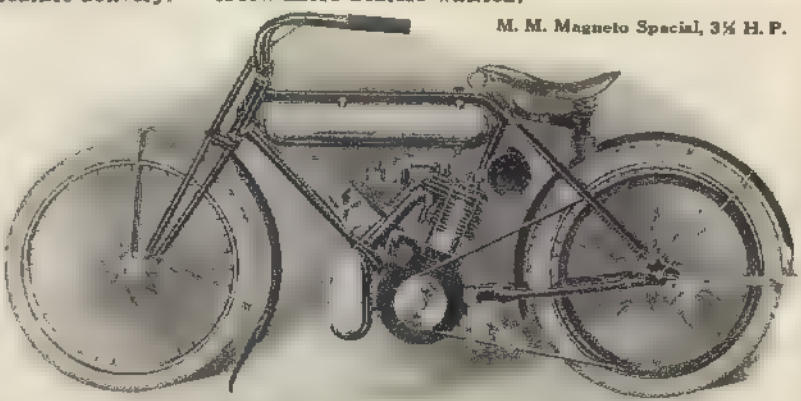
**A machine built for particular riders. Easiest controlled and most simple Motorcycle built.**

**Every rider a satisfied one. For pleasure and business the M. M. is the most economical.**

**The very finest material and workmanship goes into this machine, which has our guarantee.**

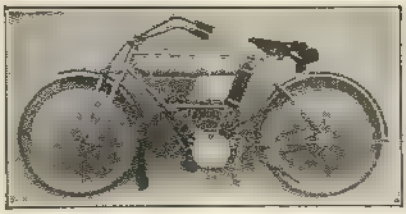
**We equip this model with the famous Bosch magneto and extra heavy tires. Immediate delivery. A few more dealers wanted.**

M. M. Magneto Special, 3½ H. P.



American Motor Company
715 Centre Street,
Brockton,
Mass

# GREYHOUND



# MOTORCYCLE

¶ The simplest and most comfortable machine of its class in the whole wide world.

¶ Strong, speedy, silent and satisfactory.

¶ Many distinctive features of unquestioned value.

¶ **The Greyhound Shock Absorber** is the best and most valuable comfort device ever used on a motorcycle.

¶ Split crank case—One piece forged steel crank shaft—Internal control—Perfect spring fork—Long wheel base.

¶ Correspondence wanted with dealers and riders.

¶ Catalogue for the asking.

**The Auto-Bi Company**
**Oldest American Makers**
**1453 Niagara St., Buffalo, N. Y.**

**SALES AGENTS:**

**Metropolitan District:**
**The Brown-Dewey Company, 1697 Broadway (53rd St.), New York.** **Chicago District:**
**Whipple, "The Motorcycle Man," 260 W. Jackson Blvd., Chicago, Ills.**

## "Wouldn't Take a *Thousand Dollars* For His Curtiss Motorcycle"

Altoona, Pa., May 28 1909
Herring-Curtiss Company,
Hammondsport, N. Y.
Gentlemen:

Machine arrived in fine condition I have had three different makes in my time and must say that your machine for Power Speed Hill Climbing and Easy Starting can never be beaten I am more than pleased with this little steed of steel, and would not take *One Thousand Dollars* for it to-day, if I couldn t get another one

Thanking you for your prompt and courteous attention given my order, I am,
Yours very truly,
A. M. CONRAD

This is but one of hundreds of similar unsolicited testimonials received from Curtiss riders

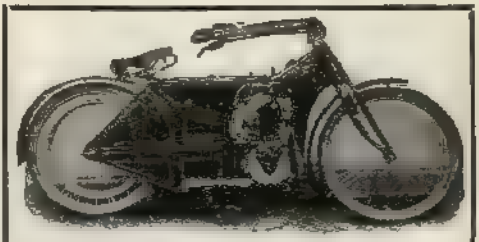
Every Curtiss motorcycle is just as good as this one

Write for Agency Proposal to-day.

**HERRING-CURTISS COMPANY**
**Hammondsport :: New York**

New York Distributor
**CURTISS MOTORCYCLE COMPANY**
**1203 Bedford Ave., Brooklyn, N. Y.**

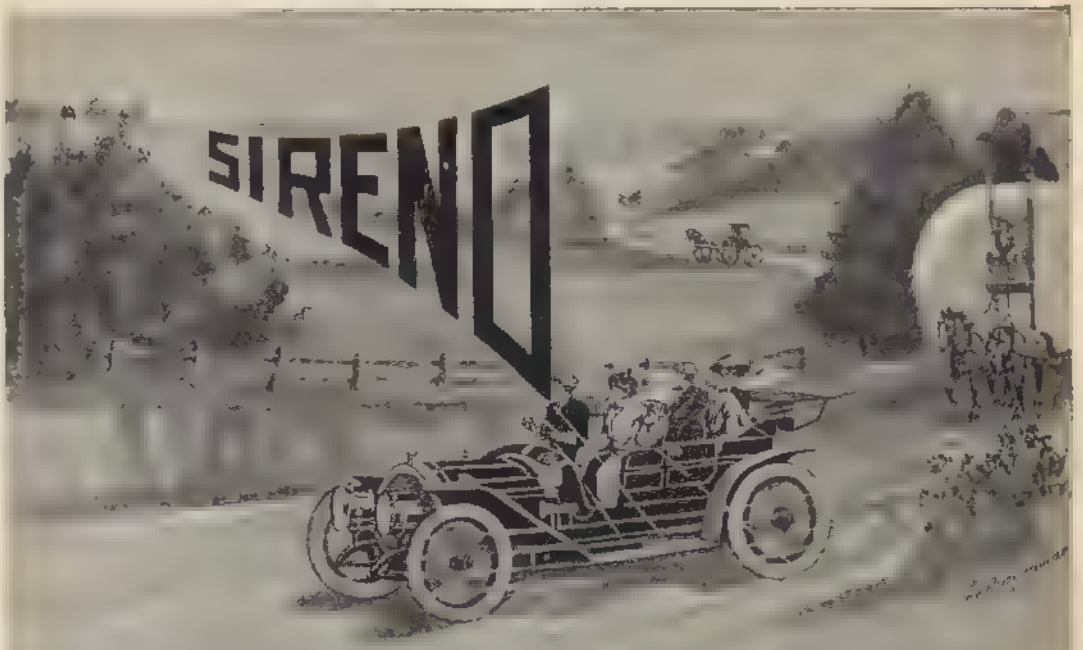
Pacific Coast Distributor:
**G. A. FAULKNER**
**351 12th Street Oakland, Cal.**



# MIDGET BI-CAR

The most comfortable Motorcycle produced. Built like a car. Agents better hear our proposition before closing contracts.

**Walton Motor Co. (Inc.)**
**Lynbrook, Long Island**
**Sole Licensees and Manufacturers**




# THE MILE-AHEAD ELECTRIC HORN

## *The Awakening of the Motoring Public*

Gradually, but with irresistible force, the *importance* of the Long Distance Signal Horn is being borne in on the minds of the motoring public. If your own observations have not confirmed this statement, let us give you some facts to substantiate the assertion.

In the last twelve months the demand for the SirenO Electric Horn has developed so rapidly that the Company's output has increased *four times* over that of the preceding year! From all indications the year 1910 will see even greater progress!

The day is not far distant when every auto owner will see the necessity of including in his regular equipment a powerful warning signal. Public safety demands it, just as it demands strong brakes or reliable headlights! Your own pleasure depends upon it!

The SirenO is the motorist's safety valve—his searchlight of sound! Its intense penetrating note compels attention.

The automobile owner of to-day has need for an electric horn—one that is operated from the ignition battery. He has neither time nor patience to bother with ancient, discarded types, or the weak, thin-voiced variety of warning signal.

The SirenO—the "Press-the-button" type—the horn that responds instantly with an unmistakable note of warning, is the only one that will fulfil his every requirement and assure his safety and comfort, and that of countless others.

The SirenO is made in six styles and sizes, varying in price from $25.00 to $38.00. They may be seen at your dealer's, or we will send you full particulars upon request.

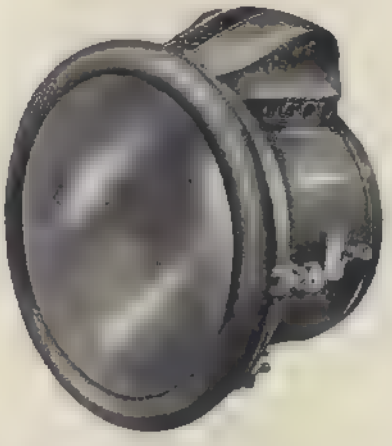
The SIRENO Company

1108 Taylor Building

New York

# SOLAR LAMPS

## Of Special Design



¶ The best and most exclusive designs--patterns that are beautiful in finish and superior in quality and material.

¶ Many American manufacturers prefer distinct lamp equipment for their cars. Something different Something more Exclusive—Something that will enhance the beauty of their Product and add to the selling qualities. Perhaps it may be a lamp to match the shape of the radiator or bonnet—a lamp of unusual design. THESE manufacturers always use ***Solar Lamps*** because they know that they secure the best that money can buy in motor lamp construction.

**The Badger Brass Manufacturing Co.**

**Two Factories:**

437 Eleventh Ave.,
**NEW YORK**

**KENOSHA, WIS.**

# Standard Six

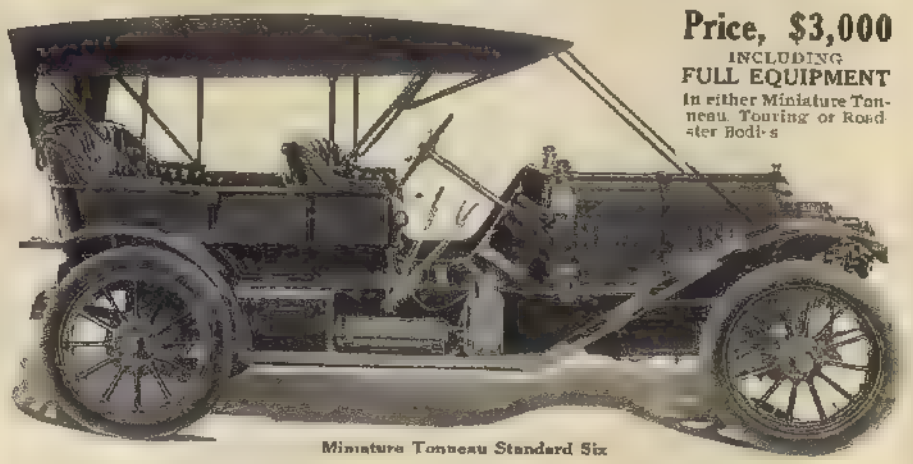
## The Car Complete

50 H. P., Shaft Drive, 124-Inch Wheel Base, Dual System Ignition, Remy Magneto and Dry Cells.

**Silent—Powerful—Swift**

4 to 65 Miles Per Hour on High Gear.
Wheels on All Stock Cars equipped with Quick Detachable Rims.

**Price, $3,000**
INCLUDING
**FULL EQUIPMENT**
In either Miniature Tonneau, Touring or Roadster Bodies



Miniature Tonneau Standard Six

### THE VERY BEST VALUE FOR THE OUTLAY

The purchaser of a motor car should look for the very best value for the outlay. There are many cars of varying degrees of worth. Some cars are dear at any price. Others of greater and more pronounced value are reasonable at three to four times the price of low-priced cars.

### LARGE PLANS OF MANUFACTURING

Have enabled us to divide with the purchaser, previous profits on so excellent a car as the STANDARD SIX. The motoring public has taken to this car as naturally as a duck to water. We have aimed to build and are building one of the Best Six Cylinder cars in America—a car of classy lines and with that Dash that makes the STANDARD SIX wanted by every prospective purchaser who looks it over or rides in it.

### THE SPLENDID CONTINUITY OF POWER IN THE STANDARD SIX

is an impelling force which impresses every lover of a motor car, and that to own a STANDARD SIX would be the height of his ambition.

WE WILL EXHIBIT AT NATIONAL AUTOMOBILE SHOW AT ATLANTA, GA., NOVEMBER 6 TO 13, SPACE 21.

SEND FOR OUR HANDSOME 12 PAGE FOLDER, GIVING FULL DETAILS.

AGENTS WANTED IN TERRITORY NOT ALREADY ALLOTTED.

**AUTOMOBILE DEPARTMENT:**

## ST. LOUIS CAR COMPANY

**Chicago, 1326 Michigan Avenue :: 5211 N. 2d Street, St. Louis, U. S. A.**

**Omaha, Neb.: Standard Motor Car Co.**

# Standard Six

## The Car Complete

50 H. P., Shaft Drive, 124-Inch Wheel Base, Dual System Ignition, Remy Magneto and Dry Cells.

**Silent—Powerful—Swift**

4 to 65 Miles Per Hour on High Gear.
Wheels on All Stock Cars equipped with Quick Detachable Rims.

**Price, $3,000**
INCLUDING
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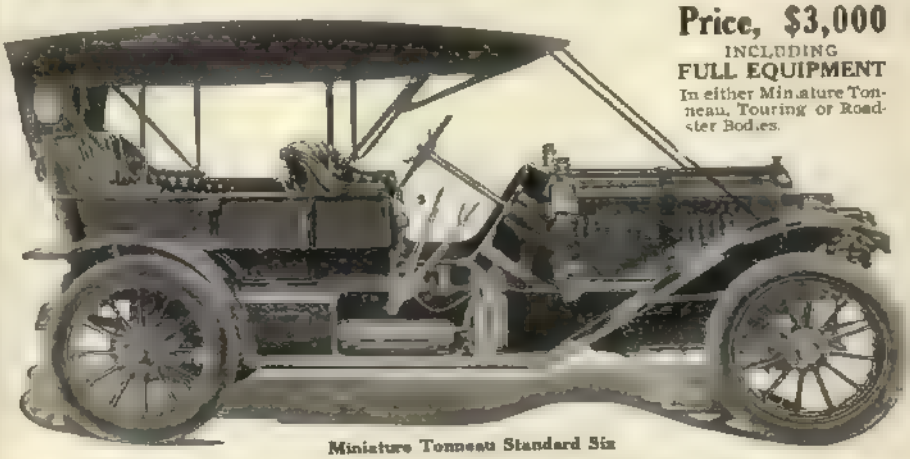

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**Send for our Handsome 12-page Folder, giving full details**

**Agents Wanted in Territory not already allotted**

**AUTOMOBILE DEPARTMENT:**

## ST. LOUIS CAR COMPANY

**Chicago, 1326 Michigan Avenue :: 5211 N. 2d Street, St. Louis, U. S. A.**

**Omaha, Neb.: Standard Motor Car Co.**

# Opens New Year's Eve

## DEC. 31 to JAN. 7

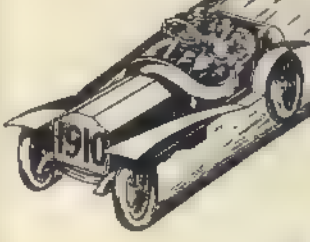
**All Leading American Cars**

**All Foreign Cars**

**All Accessory Makers**

Taxicabs
Commercial Vehicles

10TH INTERNATIONAL
**AUTOMOBILE SHOW**




**Management of American Motor Car Manufacturers' Association**

Finest Decorations by Unitt & Wickes ever offered at any Motor Car Exhibition

# Grand Central Palace

Forty-Third St. and Lexington Ave.
NEW YORK

Admission, 50c. Tuesday, $1.00

# Stevens-Duryea

# Motor Cars 1910

¶ **MODEL X** Touring Car, Five Passenger. Price, $2850.00 with Magneto. Top, with slip cover, $150.00.

A Touring body that represents absolutely the best in its essential features as required by the tourist.

¶ The Stevens-Duryea **MODEL X** Chassis is a solid foundation for a thoroughly modern Touring or Limousine Car. Price of Chassis, $2600.00.

¶ **MODEL X** Limousine, Seven Passenger. Price, $3750.00 with Magneto.

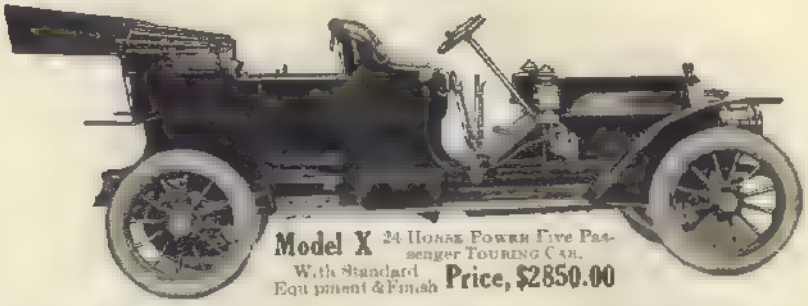
A Limousine body superbly designed for comfort. Luxuriously upholstered and magnificently finished.

## STEVENS-DURYEA COMPANY

**CHICOPEE FALLS - MASSACHUSETTS**

Members Association
Licensed Automobile
Manufacturers

# STEVENS-DURYEA MOTOR CARS 1910



**Model X** 24 Horse Power Five Passenger Touring Car. With Standard Equipment & Finish **Price, $2850.00**

## SQUARE and TAPER SQUARE
VERSUS
## ROUND, TAPER ROUND and KEY
CONNECTIONS IN
## DRIVE LINE

The Stevens-Duryea square, taper square and flange design of uniting each section in the drive line from fly wheel to rear hubs and the forging of pinion gear integral with shaft is as fine an example of engineering skill as is exemplified in the manufacture of motor cars.

This construction eliminates the use of round, taper round or key design of coupling and overcomes the one weak point in transmitting the power to the rear wheels.

The ease with which a section can be removed is the crowning point in its favor, and the accuracy of its running will be absolutely perfect when replaced, owing to the fact that only a slight pressure is required to make positive its connection.

With the round taper and key, an excessive pressure is required to unite, and if this is not applied, all rotating strains are placed on the key and keyway which cannot be designed to adequately carry the load.

The adoption of squares in drive line entails the highest cost of production and is only one of the exclusive distinctive, and proven good Stevens-Duryea points which, when given the most critical examination in regard to design, material, and sound, accurate workmanship, are found to be mechanically correct.

This exclusive drive line feature characterizes all Stevens-Duryea motor cars, and, with its other points of merit, still further enhances their value.

## STEVENS-DURYEA CO.
Chicopee Falls, Massachusetts

Member Association of Licensed Automobile Manufacturers ~ Licensed under Selden Patent

# Stevens-Duryea

## 1910 SIX-Cylinder Model Y Touring Car

*6-40 Horse Power*

**Unit Power Plant**

**Three Point Support**

**Patent Multiple Disc Clutch**

¶ STEVENS-DURYEA time-tried features are embodied in this car. In addition, the SIX-Cylinder Model Y has all improvements and refinements of standardized, accepted designs.

¶ Two independent systems of ignition.

¶ SIX CYLINDERS in higher horse-powers are not only Preferable, but Essential as well.

¶ STEVENS-DURYEA DEMONSTRATIONS will convince you.

## Stevens-Duryea Company

CHICOPEE FALLS :: :: MASSACHUSETTS

MEMBERS ASSOCIATION LICENSED AUTOMOBILE MANUFACTURERS

## THE "PURITAN" AUTOMOBILE SWITCH

One of the most novel features of this switch is the fact that it is front connected. This feature allows the wires being connected and disconnected by simply taking off the cover of the switch. This switch is manufactured by the S. H. Couch Company, Inc., 156 Purchase Street, Boston, Mass

The "Puritan" Automobile Switch

To connect the switch the wires are passed through holes B, C, D, from the back, and are attached to heavy brass machine screws.

The lever is a heavy spring brass punching with a substantial moulded handle. It can be changed from one position to another by a kick of the foot, if desired, without injury. When inserted the lever is firmly gripped by a spring brass cup washer which serves the double purpose of taking up the wear of the lever at the fulcrum and of making a very positive electrical contact.

The Puritan Automobile Switch with Cover Removed the cut is three fifths actual size

The contact springs are heavy spring brass punchings specially formed to prevent displacement and fastened with brass machine screws, one in each spring, serving as a binding screw for the wires.

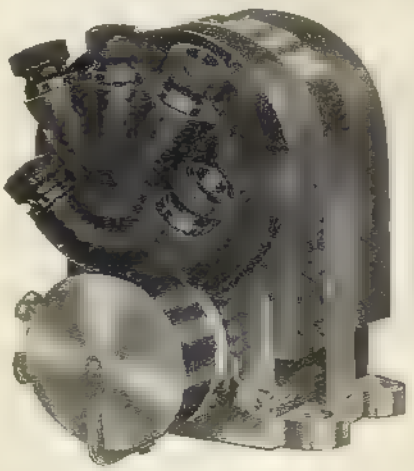
The contact end of each spring is dished to form a rubbing contact and also to partially drop into the notch on one side or the other (depending whether the lever is to the right or the left) of the detachable lever, thus hugging the lever into position.

The base of the pivot post is a heavy brass punching moulded into the switch base and forming a seat for the detachable lever as well as a terminal for one of the wires. The upright part of the post supports the spring cup washer and is straddled by the detachable lever. The pivot post as a whole is prevented from loosening by riveting the screw passing through the post.

The cover is made of heavy brass with brass etched letters on black background and fastened with two brass machine screws into brass posts imbedded in the moulded base. This switch may be used for battery and magneto or two sets of batteries. The list price of this switch is $1.00

## THE RADIUM MAGNETO

The accompanying cut illustrates the Model E, 4-cylinder, 4-cycle, low-tension magneto made by the General Accumulator & Battery Company, of Milwaukee, Wis This magneto produces the current in the armature, rotating between the pole shoes of a permanent magnet. During each revolution of the armature, two impulses of current are produced and distributed to the various cylinders by means of a distributer



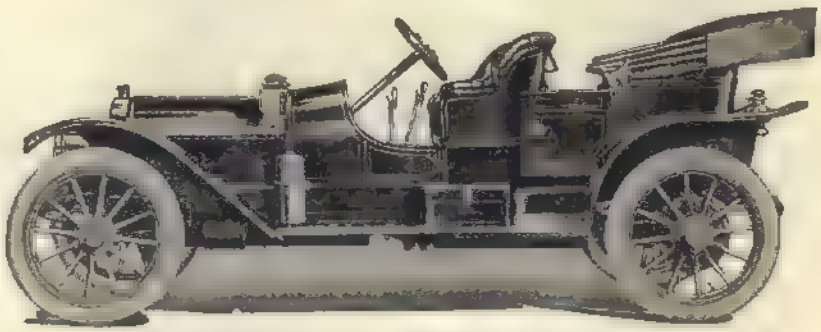
Radium Model E, 4-cylinder 4-cycle, low tension magneto Price $100.

on magneto The system used is that having an armature of but one winding. The current is discharged through a transformer having a low and high tension winding similar to a regular spark coil. This increases the current to a voltage sufficiently high to enable it to jump the necessary gap between the points of the plug in the compression chamber.

This magneto has H. & B. ball bearings throughout. It is dust-proof, requires no oiling, and is so assembled that all adjustments can be made with a screw-driver. The size of the "Radium" magneto over all is 8 inches long, 6⅞ inches high, and 5½ inches wide. The price for the Model E is $100.

# Stevens-Duryea

## Motor Cars 1910



*Light Touring Roaaster, Four Passenger, Model "X," Twenty-four Horse Power, Price, $2,850.00. In Standard Finish and Equipment. Top, with Slip Cover, $135.00*

The new straight line light touring roadster body, with detachable tonneau, as fitted to the Model "X" Chassis, is something exceptional.

## Comfort and Protection

**Appreciated Features**

Upholstery is most luxurious, while the angles of seats and backrests are so arranged that the tourists are afforded a maximum of comfort. Ample protection is made possible by a most practical design of fender. Metal guards extend the entire length of running board and connect with chassis frame, the housing over brake rods being detachable.

## Workmanship, Material and Finish

**The highest quality possible**

## STEVENS-DURYEA CO.

Chicopee Falls, Massachusetts

Member Association of Licensed Automobile Manufacturers—Licensed under Selden Patent

# Thor

THE

# MOTORCYCLE SUPREME

# THOR IV

## SINGLE

¶ The Greatest Motorcycle ever presented to the Public. Look for it at the following Shows:

*Atlanta, Ga., November 6th to 13th, 1909.*

*New York, January 8th to 15th, 1910.*

*Chicago, February 5th to 12th, 1910.*

In the meantime, write and secure agency. It's a money getter.

---

## AURORA AUTOMATIC MACHINERY CO.

**Thor Building, 1307 Michigan Ave., CHICAGO, ILL.**

# Thor

THE

# MOTORCYCLE SUPREME

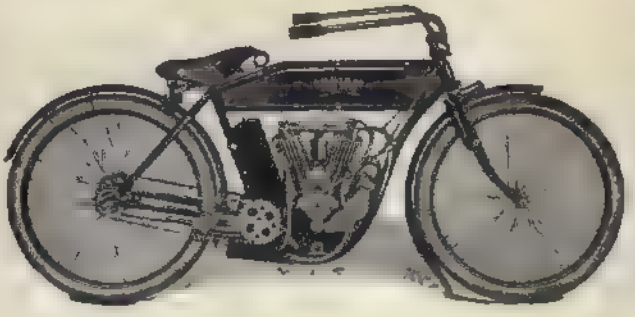
## AURORA AUTOMATIC MACHINERY CO.

Thor Building, 1307 Michigan Ave., CHICAGO, ILL.

## FOR PERMANENT SATISFACTION

Get the Machine with a Real Factory Behind It

# THE INDIAN



Is **NOT** an 'assembled' machine but is made complete in the largest exclusive motorcycle factory in the world, equipped with wonderful special automatic machinery insuring an accuracy not surpassed in the finest gun work. That's what makes the **INDIAN** so phenomenally powerful, absolutely reliable

## Hendee Mfg. Co., Springfield, Mass.

**CHICAGO BRANCH: 1251 Michigan Avenue**

[MEMBERS MOTORCYCLE MANUFACTURERS ASSOCIATION]

# Merkel Motorcycles as usual in the Lead

F. A. M. National Endurance Run -- Cleveland, Ohio, to Indianapolis, Indiana. 7 started, 7 finished. Four Perfect Scores -- 6908 Points out of a possible 7000 -- Making the HIGHEST AVERAGE of 98 Per Cent

**At Brighton Beach, Aug.** Beats all Competitors.

**At Wildwood, N. J., July**— One mile, 48 1-5 seconds.

**At Detroit, Mich., Sept. 2d**— First 5 mile handicap. Second, 10 mile open. Second mile open.

**At Rochester, N. Y., Sept. 6th** — First 10 mile open. First, 5 mile club championship.

**At Washington, Sept 6th** First 1 mile [illegible] class. Second 1 mile [illegible] class. Third, 5 mile [illegible] class.

**At Lowell Mass., Sept. 10th** First 1 mile open [illegible] class. Second 5 mile open [illegible] class.

**At Erie, Pa., Aug. 30th**— First 1 mile. [illegible] mile handicap. Second Same

**At Los Angeles, Cal., Sept. 9th** — On one mile dirt track. "Pearless" Balke, 10 miles 9.12 3-5. "Dare Devil" Derkum, 5 miles [illegible]

In the majority of events private owners with stock machines, no specials and factory men — but invariably and always **Merkel Ball Bearing Motors** — Speed, Power, Smoothness of Running. **Merkel Spring Frame Forks** — Comfort and Luxurious Riding. Ask any man on

## Merkel-Light Motor Co.

40 Hanover Street
POTTSTOWN, PA.

Standard Motorcycle Pedals

Standard Sager Motorcycle Toe Clips

# Motorcycles Demand The Best Equipment

The majority of makers of high-grade machines have learned by experience that

## Standard Motorcycle Parts

are the most satisfactory. The careful selection of materials and first-class workmanship accounts for the unvarying excellence of the Standard line, which includes

**Standard Pedals; Standard Sager Toe Clips;** a complete line of **Spokes** and **Nipples; Bridgeport** and **Star Pedals;** also **Breech-Block Spark Plugs.**

Particulars cheerfully furnished.

## The Standard Co., Torrington, Conn.

# Thor

THE

# MOTORCYCLE SUPREME

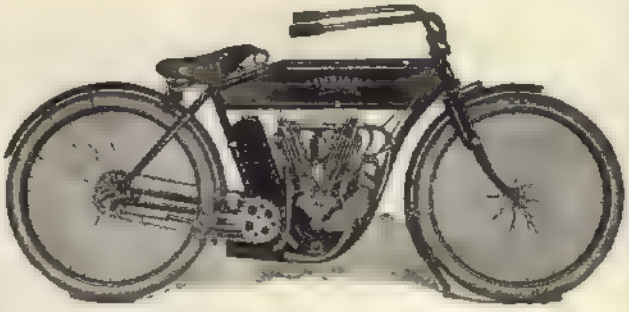
## AURORA AUTOMATIC MACHINERY CO.

Thor Building, 1307 Michigan Ave., CHICAGO, ILL.

Hill Climbing Demonstrates Sustained Power

# THE INDIAN

## SURPASSES ALL



For consistent performance. At New Haven it won all events, and was but 1 seconds behind the Benz auto monster. At Giants' Despair it won all.

Get Catalogue P.

**Hendee Mfg. Co.** **Springfield, Mass.**

Chicago Branch, 1251 Michigan Ave.

# Thor

THE

# MOTORCYCLE SUPREME

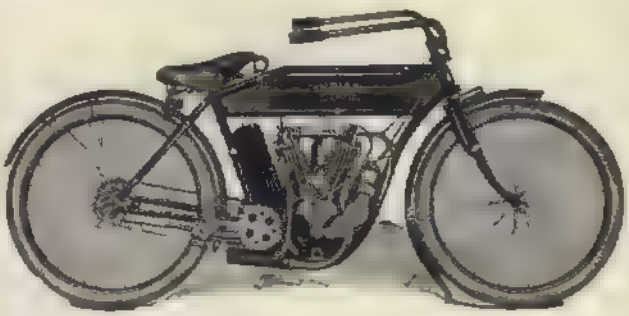
## AURORA AUTOMATIC MACHINERY CO.

Thor Building, 1307 Michigan Ave., CHICAGO, ILL.

# THE INDIAN

## Is the Most Successful Motorcycle in the World

Because its parts are so few, so simple and so perfect, and you can get at them all directly and immediately. These things insure perfect running, avoid vexatious delays and minimize expense.



No straggling levers, no loose, untidy wires, no fussy fittings, no trouble breeders.

Buy tested perfection rather than imitations and experiments.

**Hendee Mfg. Co.** **Springfield, Mass.**

**Chicago Branch, 1251 Michigan Ave.**

# Thor

THE

# MOTORCYCLE SUPREME

# THOR IV

## SINGLE

¶ The Greatest Motorcycle ever presented to the Public. Look for it at the following Shows:

*New York, January 8th to 15th, 1910.*

*Chicago, February 5th to 12th, 1910.*

In the meantime, write and secure agency. It's a money getter.

---

## AURORA AUTOMATIC MACHINERY CO.

**Thor Building, 1307 Michigan Ave., CHICAGO, ILL.**

# Thor

THE

# MOTORCYCLE SUPREME

## AURORA AUTOMATIC MACHINERY CO.

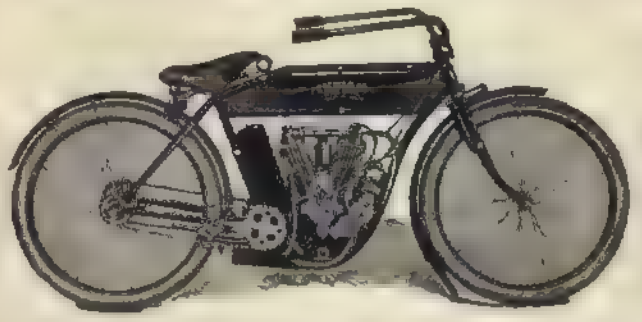
Thor Building, 1307 Michigan Ave., CHICAGO, ILL.

BEST EVERYWHERE

# THE INDIAN

FOR SPEED IT HOLDS ALL RECORDS

1 Mile, 42 3-5 Sec.—100 Miles, 87-49 and Everything Between



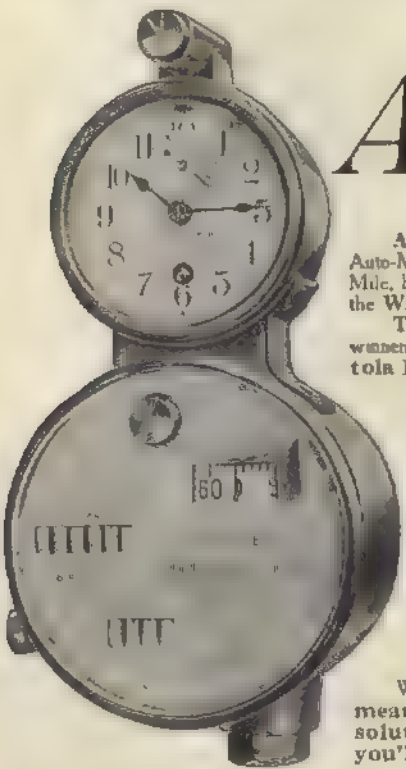
For the third year it wins Gold Medal in English 6-Days Reliability Trials, 1024 Miles, many test hills.

It holds records for only Genuine Mountain Climbing, Mt. Washington, Lookout Mountain, Grant's Despair

**Hendee Mfg. Co. Springfield, Mass.**

**Chicago Branch, 1251 Michigan Ave.**

# Look
## At this
# Big
# Bunch
## Of
# Victories
## For the One Accurate and Reliable Speed Indicator



The Model M, the Type most popular with owners of high-class cars.

# *The Warner*
# *Auto-Meter*

### Here are the Telegraph Reports:

**At the Seattle Automobile Carnival** every car entered was Auto-Meter equipped. Winning cars in Five-Mile, Two Ten-Mile, Fifty-Mile, Hundred-Mile, 24-Hour Endurance and Hill Climb were paced by the **Warner Auto-Meter.**

**Tanforan Races, San Francisco:** In the 300-Mile Race both winners (Lozier first, Thomas second) use the Warner Auto-Meter. **Portola Race, San Francisco:** Fourteen out of fifteen cars entered were equipped with Auto-meters. Pope-Hartford first, Apperson second; both had Auto-meters on the dash.

**Vanderbilt Cup Race:** Ten cars out of the fifteen starting used the Warner Auto-Meter. Four used none at all. The winning Alco, driven by Grant, was helped to victory by the dependable Auto-Meter.

**Wheatley Hills Sweepstakes:** The Winning Marmon, driven by R. W. Harroun, was equipped with the accurate Warner Instrument.

**Ascott Park Races:** All seven cars in this event used the Reliable Auto-Meter as a pace maker.

**At Atlanta:** Buick winner 200-Mile Stock Chassis Race; Marmon winner 10-Mile Free-for-all Handicap, and National winner 10-Mile Stock Chassis Race, ALL Auto-Meter equipped.

We have said before, and we repeat it, that **wherever speed means something and even a slight departure from absolute accuracy may mean loss of money or prestige, you'll always find the Auto-Meter used to indicate that speed.** Those who have tried all kinds and KNOW, have found the Auto-Meter to be the only speed indicator they can depend on.

**The Warner Instrument Co.** Factory and Main Office: 67 Wheeler Avenue. **Beloit, Wis.**

**BRANCH HOUSES**

NEW YORK, 1902 Broadway
SAN FRANCISCO, 38-38 Van Ness Ave
ST. LOUIS, 3923 Olive St.
INDIANAPOLIS, 330-331 N. Illinois St.
DENVER, 1518 Broadway
SEATTLE, 914 E. Pike St.
CHICAGO, 2420 Michigan Ave.
PITTSBURG, 3432 Forbes St.
CINCINNATI, 122 E. Seventh St.
DETROIT, 870 Woodward Ave.
PHILADELPHIA, 302 N. Broad St.
BUFFALO, 720 Main St. (19)
BOSTON, 925 Boyston St.
CLEVELAND, 2062 Euclid Ave.
LOS ANGELES, 1212 S. Main St.

**110″ Wheel Base**
**Dual Ignition System**

# 24-26 H. P.—$1100

**f. o. b. Detroit**
including equipment specified below

Model A10, 24-26 H. P., Four Cylinders cast en bloc; Sliding Gear, Selective Type; Cone Clutch.

# Warren-Detroit

Price includes Volta High Tension Magneto; three oil lamps, two gas lamps; generator; tire repair kit and tool kit.

## Standard from Tires to Spark Plug

Here's a car standard from tires to spark plug. Nothing radical. No new freakish ideas—a practical, substantial machine that will do fifty miles an hour or better if you want it.

It is a big car at a reasonable price; 24 to 26 H. P.; 110″ wheel base.

500 are being built. Deliveries will be made as scheduled. Behind the Warren-Detroit are some of the ablest men in the automobile business—men ripe in experience, whose connection with the industry dates back as far as the first successful machine. Interested with them are a number of automobile parts manufacturers. Everyone of them a name that stands for Quality Success—"Make good."

### These Are the Specifications:

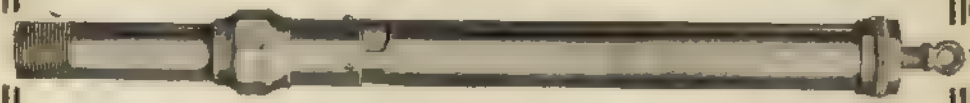
**Price:** $1100.
**Cylinders:** Four, cast en bloc.
**Bore:** 4 inches.
**Stroke:** 4½ inches.
**Valve Arrangement:** All on one side.
**Cooling:** Water, centrifugal pump and fan
**Ignition:** Jump spark, dual system same as on the highest-priced cars.
**Current Supply:** Volta high tension magneto and dry cells, same as on the highest-priced cars.
**Lubrication:** Self-contained pump.
**Tires:** 32 x 3½ inches.
**Body:** Roadster.
**Wheel Base:** 110 inches.
**Gauge:** 56 inches.
**Springs:** ½ elliptic front, ¾ elliptic rear.
**Brakes:** Two sets on hubs.
**Clutch:** Cone.
**Change Gear:** Sliding gear, selective.
**Speeds:** Three forward and one reverse.
**Drive:** Shaft.

**DEALERS:** **Please note there are only 500 Warren-Detroits coming through. Territory is going fast. Get busy. Write at once.**

## Warren Motor Car Co., Detroit, Mich.

# Nightingale Whistle

"The Whistle with the harmonious six-note bird-like trill"



## THE SIMPLEST SIGNAL EVER

Has them all beaten a mile in penetration and a million miles in attractiveness Operated from the exhaust **Never clogs, never out of order, always ready,** no two-way valve. Made for 1, 2, 4 and 6-cylinder cars—**all the same price.**

OUTFIT **$7.00** F. O. B. NEW YORK

Special Clamp for any exhaust pipe, 75c. With this Special Clamp

**"Nightingale" can be attached by anybody in less than an hour**

**Nightingale Whistle Manufacturing Co.**

1781 BROADWAY, NEW YORK

## GARAGE COMPRESSOR

No Garage complete without the "Improved Delpeuch" Compressor, **of metal throughout. No leather packing or washers.** Is water-jacketed and can be run continuously. **Works in any position.**

Driven from motor direct or from line-shaft. Gives 200 lbs. pressure or more in shortest possible time.

Complete outfit, exactly as shown in cut,

**$66.50**

f. o. b. N. Y.

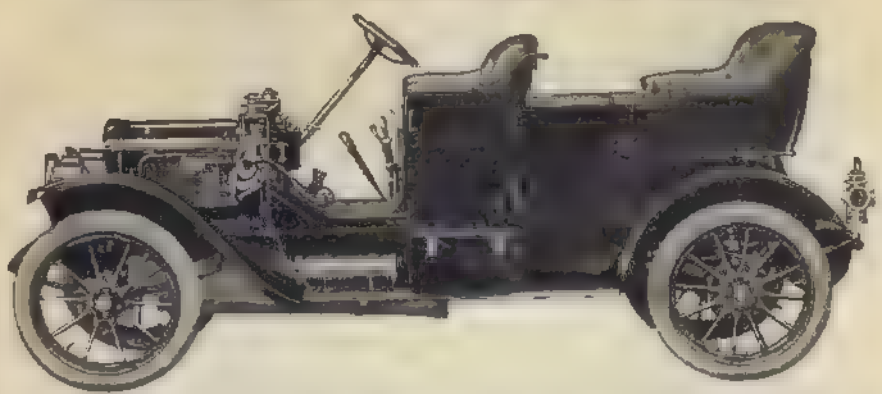
The tank furnished is guaranteed air-tight, tested for 200 lbs. working pressure size 60"x12"; connections, safety valve, globe valves, etc., are standard makes

**Nightingale Whistle Manufacturing Co.**

1781 BROADWAY - NEW YORK

# DRIVE A WHITE STEAMER

## and use kerosene as fuel



The reputation of the White Steamer as the most satisfactory car for all-around use has been further strengthened by the modifications in design in the 1910 models, whereby kerosene may be used as fuel instead of gasoline.

The new fuel offers many obvious advantages. First of all, it costs from 5 to 12 cents less per gallon than gasoline. Secondly, it may be obtained at any grocery store, either in the city or in the country, and at almost any farm-house. Thirdly, kerosene will yield a greater mileage, gallon for gallon, than gasoline. Fourthly, it may be handled without any precautions; for example, the fuel tank may be filled regardless of the nearness of lighted lamps or lighted cigars. Kerosene may be stored in ordinary barrels and it is no longer necessary for private garages to install expensive underground storage tanks.

The Motor World, referring to the use of White Steamers during the recent military manoeuvres in Massachusetts, said: "The preference shown the White Steamers is explained by the fact that they can be run on kerosene in places where the use of gasoline cars is prohibited by the military regulations." The White Steamer is the only car which is carried by the steamship lines without draining its fuel tank.

We publicly proved that kerosene fuel is a comp'ete success, on the recent 2,650 mile Glidden tour. Not a single penalty and not a moment's delay resulted from its use.

**Write for Descriptive Circular**

# THE WHITE COMPANY

New York City, Broadway at 62d St.
Boston, 320 Newbury St
Philadelphia, 629-33 N. Broad St.
Pittsburg, 138-148 Beatty St.
Toronto, 170 King St., West

**869 East 79th Street**
**CLEVELAND**
**OHIO**

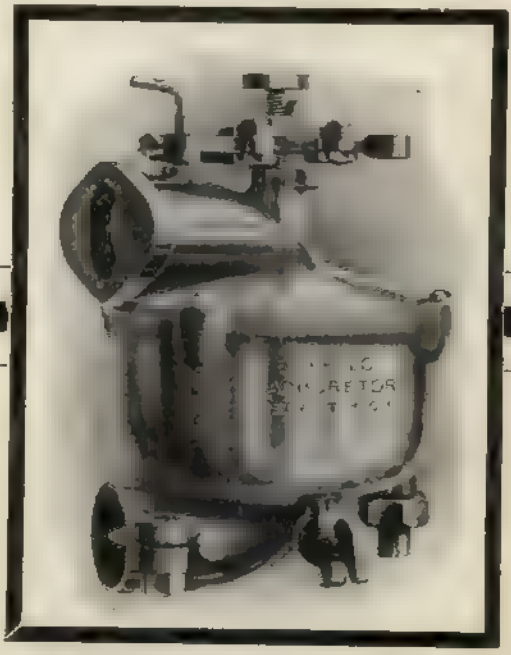
Cleveland, 407 Rockwell Ave.
Atlanta, 120 122 Marietta St.
Chicago, 240 Michigan Ave.
San Francisco, Market St. at Van Ness Ave.

¶ No matter how good your engine, you can't have power and speed unless your Carburetor is right.

# THE BUFFALO

## Mechanically-Operated Carburetor

will increase the efficiency of your engine with less gasoline consumption than any other make.



¶ That sounds like a sweeping statement, but its truth can be subtantiated by a trial of the **BUFFALO.** We've been perfect ng it for years, so there is no need for you to experiment. We offer you an **absolutely mechanical carburetor;** one **unaffected by vibration or atmospheric conditions;** and one that **positively will increase power and mileage.** Why be content with inferiority when it is possible to obtain the best?

**BUFFALO CARBURETOR CO.**

**Grand River Ave. & Stanton St., Detroit, Mich.**

# WHITE STEAMER

**Goes Through the 2650-Mile**

# GLIDDEN TOUR

**USING**

## Kerosene as Fuel

The new fuel was publicly proven to be a complete success. Not a moment of delay and not a single penalty resulted from its use. Kerosene was purchased from 6 to 10 cents a gallon cheaper than gasoline; it was obtainable at any cross-roads store; and it could be handled without any precautions. Finally, the new fuel was shown to be more efficient, gallon for gallon, than gasoline and it was proven to be absolutely smokeless and odorless.

**Either kerosene or gasoline may be used as fuel in the 1910 White Steamers**

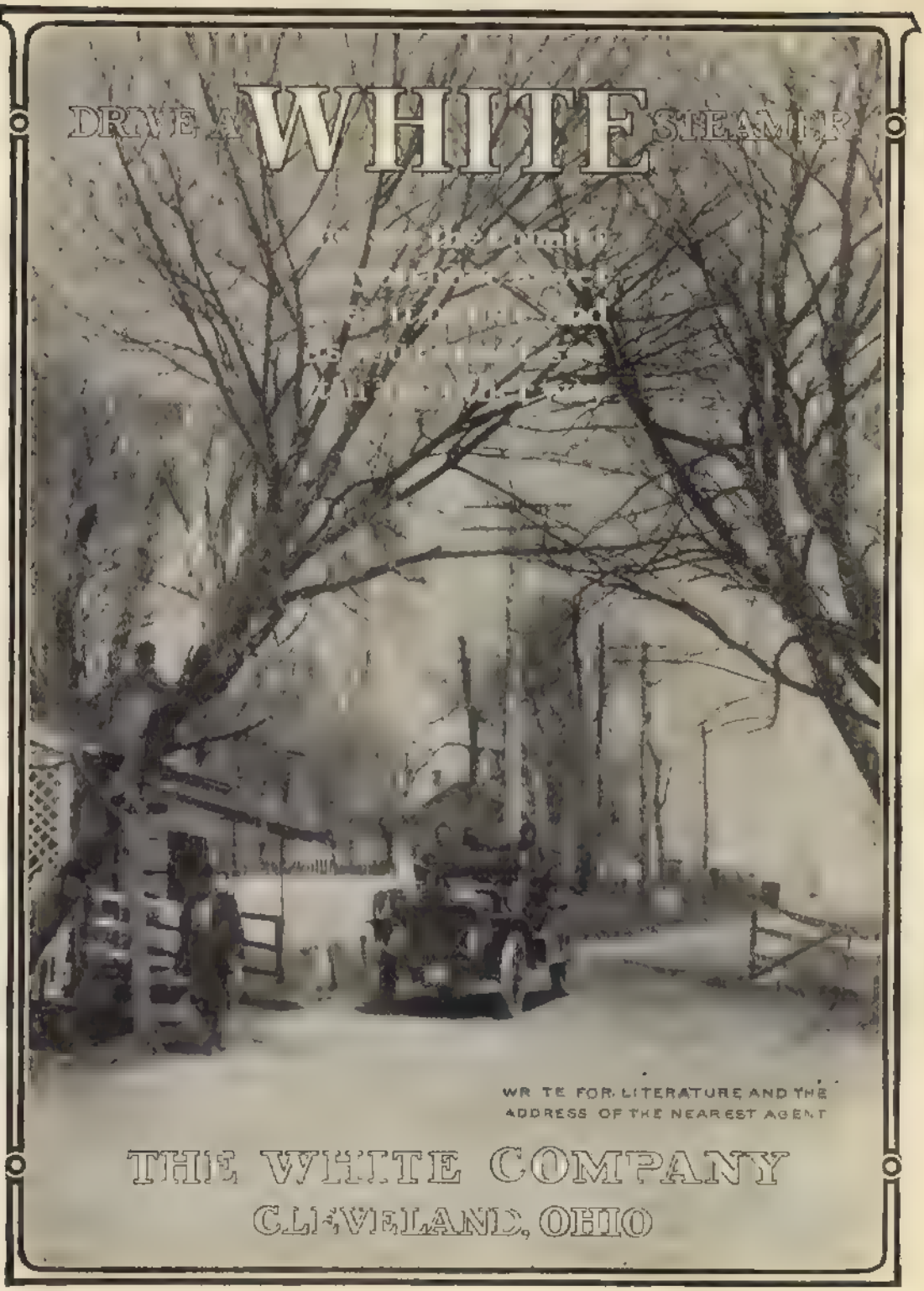
# THE WHITE COMPANY

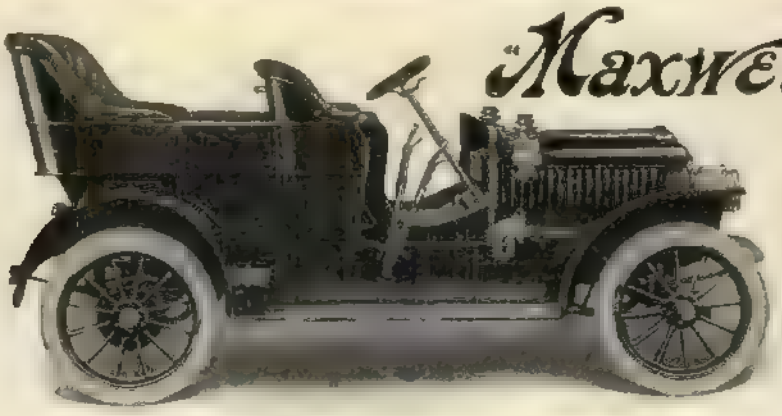
New York City, Broadway at 62d St.
Boston, 320 Newbury St.
Philadelphia, 629-33 N. Broad St.
Pittsburg, 138-148 Beatty St.

**860 East 79th St.**
**CLEVELAND OHIO**

Toronto, 170 King St., West

Cleveland, 407 Rockwell Ave.
Atlanta, 120-122 Marietta St.
Chicago, 240 Michigan Ave.
San Francisco, Market St. at Van Ness


DRIVE A WHITE STEAMER
WRITE FOR LITERATURE AND THE ADDRESS OF THE NEAREST AGENT
THE WHITE COMPANY
CLEVELAND, OHIO




**MODEL D-A, $1,750**

**4-cylinder, 30 H. P., equipped with gas lamps, generator and magneto.**

# AFTER 10,000 MILES—"NO APPRECIABLE WEAR"

**is the verdict of the committee of four experts who took apart and examined the MAXWELL at the finish of its great non-stop run of 10,074 miles.**

## THESE MEN KNOW

These men who examined and reported on the condition of this car KNOW—they are experts in their respective lines. Mr. C. F. Park, who had charge of the examining committee, is professor of mechanical engineering at the Massachusetts Institute of Technology. Perhaps no man is better qualified to judge as to the condition of an automobile than Mr Park

Mr James Fortescue, secretary of the Bay State Automobile Club, is a man of wide experience in the automobile field

Mr. C. J. Bailey and Mr. V. A. Charles are gentlemen who have for years been associated with the automobile industry. They are men whose practical experience made their services on this committee particularly valuable.

## HERE IS WHAT THEY SAY:

"The power unit—engine clutch and transmission was removed from the car and completely taken apart. It was the intention of the committee to measure all lost motion or wear in the main and important bearings before the boxes were opened, but as these bearings showed no appreciable wear the plan was abandoned. In fact, the crank pin bearing No. 3 was still so tight that the connecting rod would stand a number of degrees out of plumb without falling over."

## ENGINE WEAR INAPPRECIABLE

That's what the committee reported—and yet this car had covered 10,074 miles under more than ordinary touring conditions. Think of it! Practically two seasons' use without an engine stop, and then the committee reported "No perceptible wear." Yet the MAXWELL covered more than 10 000 miles, running continually over the roads without giving its engine a moment's rest or its drivers a chance to make those little adjustments that mean so much to the life of an automobile. In spite of this, the wear on the engine on the bearings, on the clutch, on the gears, in fact on every moving part, was inappreciable

## THIS MECHANICAL EXAMINATION

was made by impartial judges, and their written and signed report we will gladly mail to you. No automobile has ever been subjected to such an exacting test. It was not enough for us to know that the MAXWELL could more than double the best previous world's non-stop record. We wanted to prove publicly that the car finished in practically as good running condition at the end of 10 074 miles as at the beginning. That's why we turned the car over to the Bay State Automobile Club, who appointed this committee of four experts to examine and report.

## WHAT'S THE REASON

that this car showed "no appreciable wear"? There must be some mechanical reason.—THERE IS— No other car except the MAXWELL incorporates in one design the principles of UNIT CONSTRUCTION AND THREE POINT SUSPENSION—MULTIPLE DISC CLUTCH—THERMO-SYPHON COOLING AND STRAIGHT LINE SHAFT DRIVE. These features make it possible for a MAXWELL car to go twice as far as any automobile has ever gone without stopping its motor and finish with no "appreciable wear."

Doesn't this 10,000-mile Non-Stop Run prove that the MAXWELL in points of reliability and endurance, is the car you want? Over 14,500 owners say that no car is so satisfactory to own. Won't you take your time now to investigate the MAXWELL? Let us send you copy of this official report, and booklet on the great 0 000-mile Non-Stop Run.

## MAXWELL-BRISCOE MOTOR CO.

**P. O. BOX 110. TARRYTOWN, N. Y.**

PAWTUCKET, R. I. MAIN OFFICE AND FACTORY NEW CASTLE, IND.

ANTI-CORROSIVE
GAS ENGINE LUBRICANT
MANUFACTURED ONLY BY
M. KELLOGG & CO.
IS THE BEST FOR AUTOMOBILES AND MOTOR BOATS

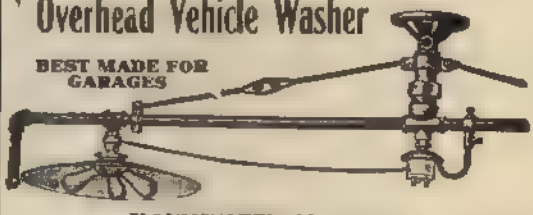
The Swan Handy Curtain Clip
Made of Spring Brass
Manufactured by
Detroit Auto Shield Company
1298-1304 Woodward Ave., Detroit, Michigan

At Last, perfect lights for Automobiles and Boats
THE ASHTON
Acetylene Separator
PRICE, $5.00
Won't Generate Gas
BUT WILL
Prevent clogging and never necessary to blow out pipes. Lights never go out. Used with any generator. Send for pamphlet. Mailed on receipt of price. Liberal discount to the trade.
W. E. Ashton & Dorr Co.
Pat. July, 27, 1909 2011 Walnut St., Phila., Pa.

Perfection Auto Clock
A neat and accurate Dash Clock
Post Paid
$4.00
Perfection Auto Clocks are made from cast brass and highly polished and nickel plated. Have a good 24-hour watch movement, stem winding, stem setting, also large plain figures
Write for trade discounts
Manufactured by
PERFECTION MFG. CO., Cleveland, O.

WORDY HORN BLOWER
Only $2.00
Honk with Your Foot

Fits Any Horn-Tube On Any Car.
We Guarantee It for 5 Years
WORDINGHAM AUTO SUPPLY CO.
Dept. C, 803 Grand Avenue Milwaukee, Wis.

Overhead Vehicle Washer
BEST MADE FOR GARAGES

ILLUMINATED OR PLAIN
Send for Prices
VEHICLES SPECIALTY CO.
26 State Street HARTFORD, CONN.

Seamless Brass and Copper Tube
SMALL SIZES AND THIN GAUGES A SPECIALTY
Arthur T. Rutter & Co., 256 Broadway, N. Y. City

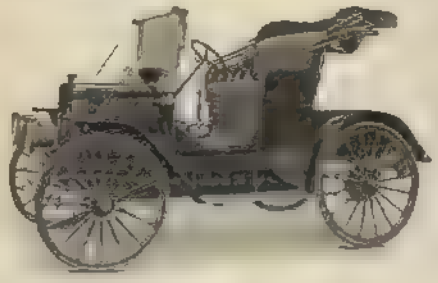
DUPLEX VERTICAL TUBE RADIATORS

MADE ONLY BY
ROME-TURNEY RADIATOR CO.
— ROME, N. Y. —
PATENT APPLIED FOR

# H. H. BABCOCK COMPANY

WATERTOWN, NEW YORK

**65 Years' Reputation Behind It**



## NOT A MOTOR BUGGY

but a solid tired Automobile. Freedom from tire and mechanical troubles is the result of owning a **Babcock.** Built only for those willing to pay for quality and workmanship. If you are looking for an automobile at buggy price, don't write us. Otherwise write us for further information and printed matter.



WITH OR WITHOUT GOLD INITIAL

**Grinnell "Rist-Fit"**

# AUTO GLOVES

**With or Without Gold Initial**

are the Ideal Automobile Gloves for winter.

**The "Rist-Fit"** is an exclusive feature. It is patented and found in no other Auto Glove. A "V" of soft leather is set into the cuff, giving a close, smooth fit at the wrist, with one pull of the strap or woven tape. The gauntlet never sags and all wind, snow and dirt is excluded.

For fall and winter the **Grinnell "Rist-Fit" Auto Gloves** have large roomy cuffs, readily admitting the largest coat sleeve. Warmly lined with eider-down, camel's hair knit glove, lamb skin, squirrel, etc.

**GET A PAIR ON APPROVAL**

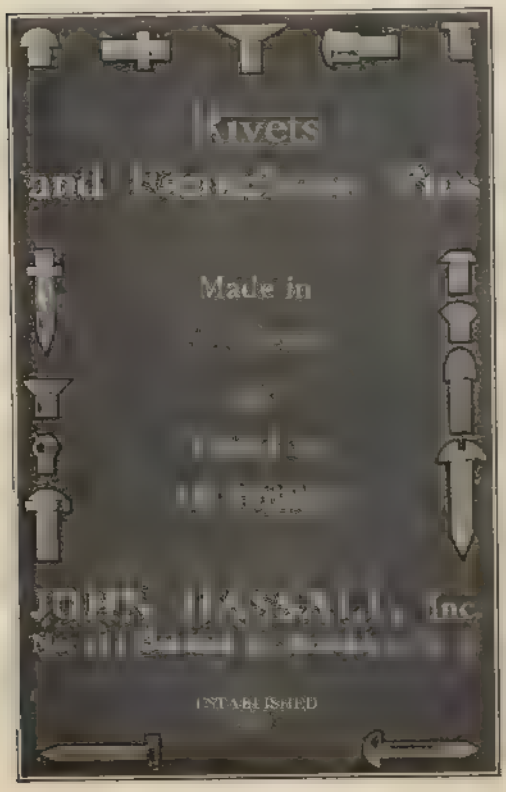
Examine a pair of these gloves at our expense—just send us your dealer's name, with the size and style you prefer and a pair will be promptly sent you prepaid. For men and women.

**MORRISON-RICKER MFG. CO.**

**70 Broad Street, Grinnell, Iowa**

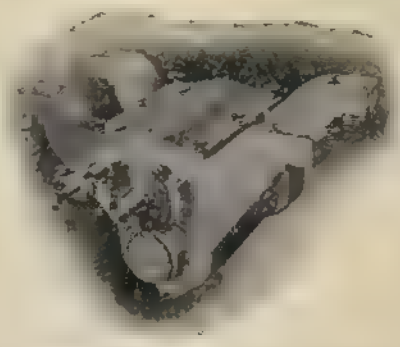
Originators and Patentees of Ventilated and "Rist-Fit" Gloves.








# 1909 TRANSMISSIONS AND PARTS



"SELECTIVE SLIDING"—35 and 50 H. P.

**For Timken Roller Bearings and Annular Ball Bearings**

Gears are made from **Special Gear** forgings, hardened, ground and "treated." We also furnish "selective" control levers. We build both spur and bevel types of differentials. **OUR STEERING GEARS** are built to "stand up" under all conditions.

**WARNER GEAR CO. - MUNCIE, IND.**

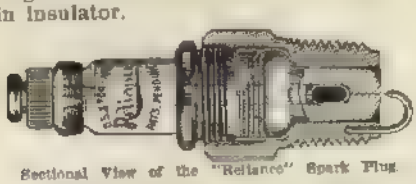
## THE "RELIANCE" MOTORCYCLE SPARK PLUG

The accompanying cuts show the Reliance motorcycle spark plug, which has been designed specially for motorcycle use It is manufactured by the Jeffery-Dewitt Company, of Newark, N. J.

The insulated sparking point is a hair-like platinum wire entirely protected from

The "Reliance" Spark Plug

corrosive action by being baked in and brought flush with the surface of the porcelain insulator.



Sectional View of the "Reliance" Spark Plug.

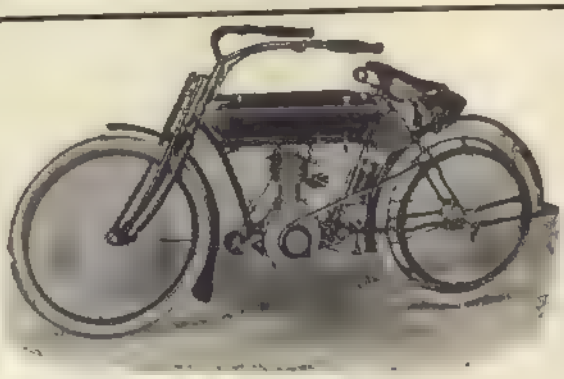
Contact with the hair-like platinum wire is made by means of a copper quill around which is a mica tube, introduced in order to prevent leakage of current in case of an accidental fracture. Under the cap is a small pellet of high resistance material, through which the current passes from the cap to the copper quill or central conductor. This little pellet serves the same purpose as an air gap, having all its recognized advantages, without any of its objectionable features.

The porcelain is flexibly supported by asbestos wicking compressed within a metal sheath, one element, which is instantly removable.

## TESTS OF GREASE UNDER HEAVY BEARING PRESSURES

In automobiles, abnormal bearing pressures are liable to occur which severely test the quality of the lubricant employed. In some tests of Keystone grease, manufactured by the Keystone Lublicating Co. of Philadelphia, recently made by a competent authority, this well-known automobile lubricant, it is claimed, showed remarkable performance under heavy bearing pressures. The Olsen testing machine was employed, and the pressure was increased by steps of 86.2 pounds per square inch up to a maximum pressure of 431 pounds, a full 60-minute run being made at each pressure. During the entire run at each pressure, it is reported, the lubricant maintained true fluid friction between journal and bearing, and withstood the temperature rise without a sign of any disintegration.


# YALE 3½ H. P. MOTOR-CYCLE



**With Flat Belt and Idler, $205**
**Herz Magneto, Extra, . $35**

## EVERY CLAIM PROVED

YALE team of 3 riders wins Chicago Motor Cycle Club endurance contest with Carburetter, Vibrator, Battery Box and Spark Plugs sealed, in competition with most of prominent makes.

600 miles without a single adjustment, making perfect team score with every seal intact

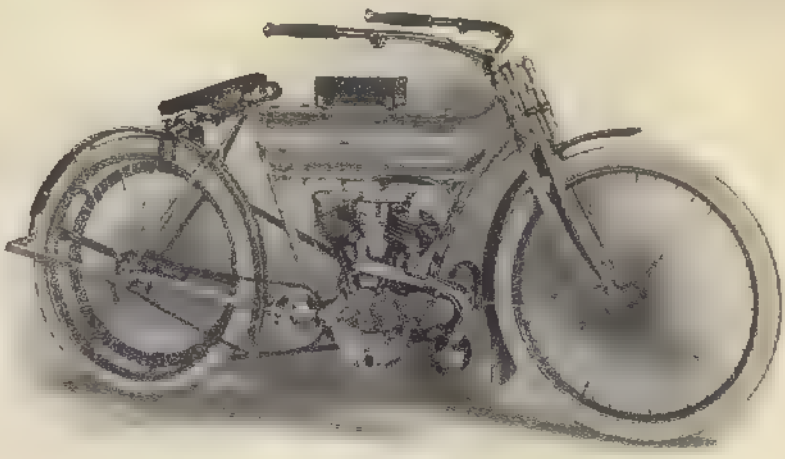
AVERAGE SPEED TWENTY MILES AN HOUR Conceded by all contestants to be the most severe contest ever held.

This performance establishes a record for dependability unheard of in the history of Motor Cycle building. THEY ARE ALL ALIKE.

Room for a few aggressive agents. WRITE TO-DAY.

**The Consolidated Mfg. Co.,** 1710 Fernwood Avenue TOLEDO, OHIO

# YALE 1910 MODELS



## 6½ H. P. TWIN

**Equipped with V Belt and Bosch Magneto, $300**

THE YALE Motorcycle this year established the WORLD'S RECORD for ENDURANCE, MADE GOOD on every test NO MATTER HOW SEVERE, and PROVED ITS SUPREMACY AMONG ALL OTHERS.

It is operated at the "LOWEST POSSIBLE UP-KEEP EXPENSE."

This feature is considered more carefully by KNOWING riders than any other.

It is not a racing machine, yet is capable of 45 miles an hour and has given good account of itself in more than one speed contest, in addition to climbing any and all hills encountered in cross country riding.

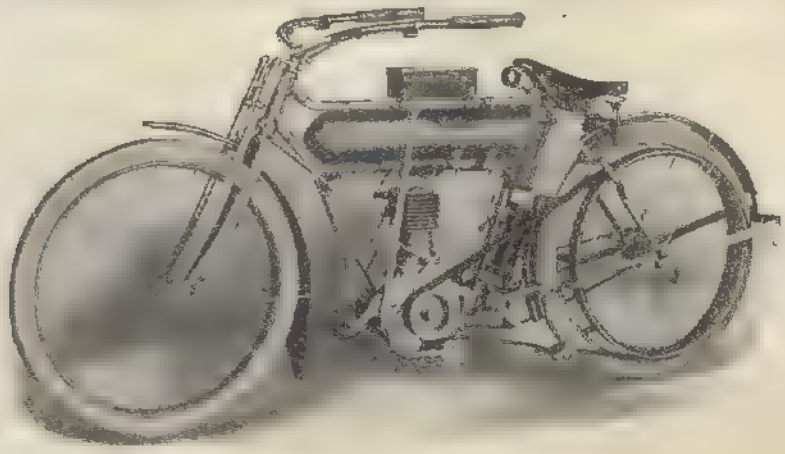
To the rider desiring greater speed we offer the YALE 6½ H. P. TWIN CYLINDER, built and operated on the same lines as the single.

These 1910 MODELS are an improvement over our past successful efforts, and mark an era in the history of motorcycle building.

We solicit correspondence from dealers in unoccupied territory.

*IMMEDIATE DELIVERIES*

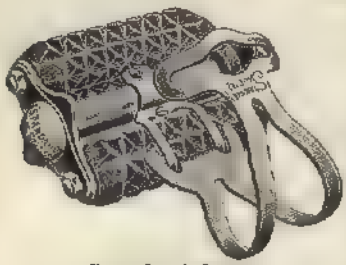
**THE CONSOLIDATED MFG. CO., 1710 Fernwood Ave., TOLEDO, OHIO**



## 3½ H. P. SINGLE

**Equipped with Flat Belt, Battery Ignition, $200. S. G. V Belt optional. Herz Magneto, $35**

Standard Motorcycle Pedals



Standard Sager Motorcycle Toe Clips

# Standard Motorcycle Parts

are the equipment seen on the largest number of high-grade machines. WHY? Because of their unvarying excellence and recognized and permanent value.

STANDARD PEDALS are strongly made. The rubbers have deep corrugations which hold the foot firmly and absorb vibration. The rubbers may be turned, thus presenting new surfaces for wear.

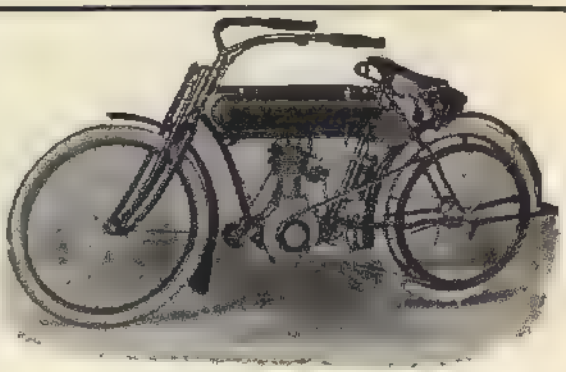
STANDARD SAGER TOE CLIPS are the most comfortable made, holding the foot securely without undue pressure. Careful workmanship and finish are features.

We also manufacture a complete line of SPOKES and NIPPLES, BRIDGEPORT and STAR PEDALS, on which it will pay you to get prices. The famous BREECH BLOCK SPARK PLUG is one of our products.

## The Standard Co., Torrington, Conn.

# YALE 3½ H. P. MOTOR-CYCLE

With Flat Belt and Idler, $205
Herz Magneto, Extra, . $35



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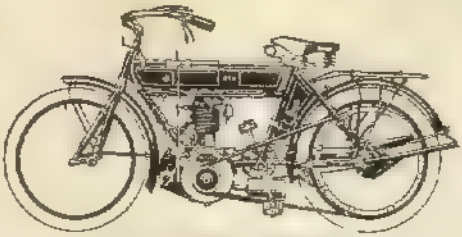
Room for a few aggressive agents. WRITE TO-DAY.

**The Consolidated Mfg. Co.,** 1710 Fernwood Avenue TOLEDO, OHIO

# N. S. U. THE WORLD'S BEST MOTORCYCLES



4 H. P. MODEL DE LUXE

## Are You on the Lookout

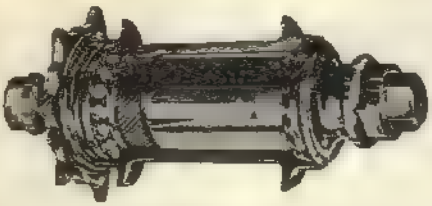
for an agency which will bring you the best class of customers? You should then consider the N. S. U. The workmanship of our models surpasses any machine in existence, their performances are only short of marvelous

We are in a position to make immediate deliveries on all models.

Write for our Big "A" Catalogue.

**N. S. U. MOTOR COMPANY**
**205 W. 76th Street :: New York City**

# Past Reputation is a Good Guarantee for the Future



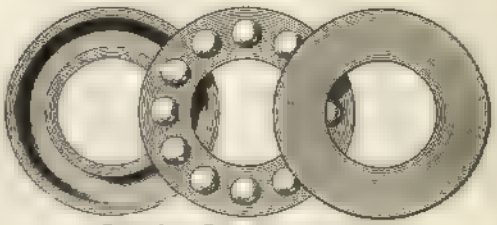
## The Eclipse Coaster Brake

during this season has been the most popular and satisfactory brake on the market. It is the only one which gives absolutely no trouble; and it is also the only one suitable for high-powered motorcycles, as it is exceedingly strong. If you are one of the few dealers not handling the **ECLIPSE**, better get prices and particulars to-day.

**Eclipse Machine Company, Elmira, New York**

# THE STAR BALL RETAINER CO.

Lancaster, Pa., U.S.A.



Complete Thrust Bearing

Radial Retainers

**Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings, Special Stamping, etc.**

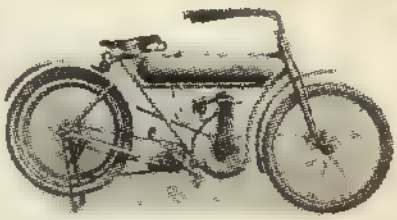
# GEER MOTORCYCLES

5-H. P. 2-cylinder GEER EGG $225.00
4-H. P. MACHINE - - - 200.00
2¾-H. P. GEER Model 4 150.00
Used motor-cycles - - - 40.00

We have the largest line of new and used motorcycles in the country at the lowest prices. Every machine guaranteed. Repairs a specialty. Motors and castings for air-ships. Motors for railway velocipedes. Send for catalogue.

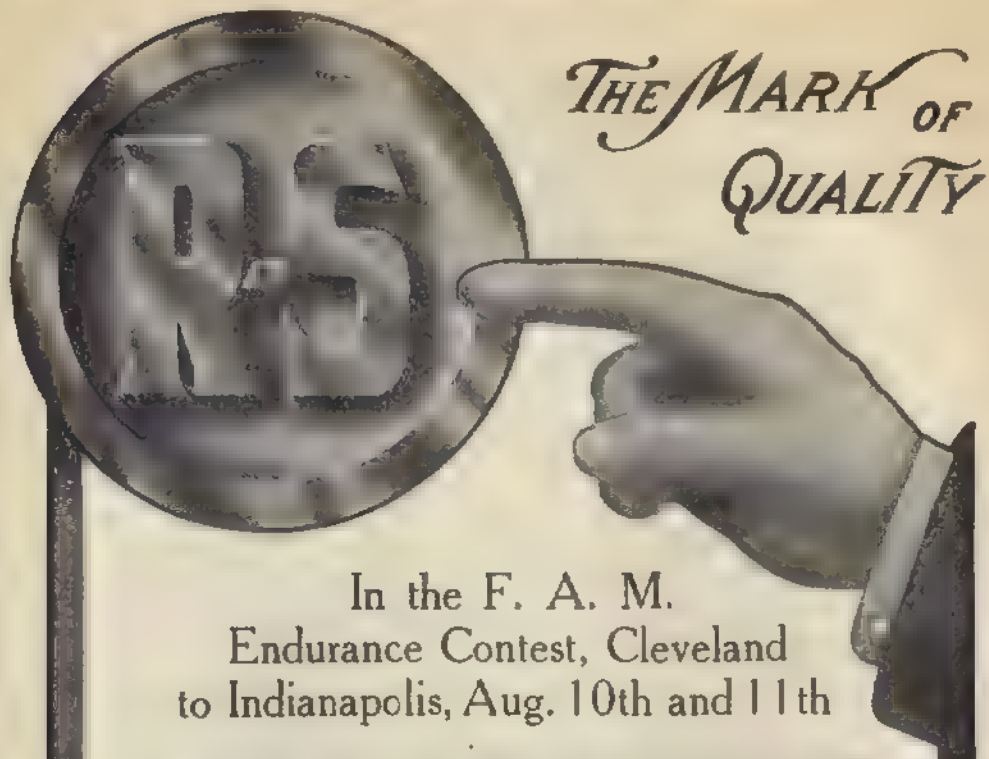
HARRY R. GEER CO.
**856 McLaran Ave. St. Louis, Mo.**

# The EAGLE Motor Cycle



**Eagle Motor Works**
*1111 East Franklin Avenue*
**Minneapolis, Minnesota**

3 H. P. $185
3½ H. P. 200
4 H. P. 225




*The Mark of Quality*

In the F. A. M.
Endurance Contest, Cleveland
to Indianapolis, Aug. 10th and 11th

# 9 R-S FINISHED

## 4 GOLD MEDALS (perfect scores)
## 5 SILVER MEDALS

¶ Again demonstrating **R-S durability** and **superiority.** All of these machines were single cylinder models and with one exception all of them were equipped with 3 H P. motors, **the smallest single cylinder R-S motor made** making the performance a truly remarkable one, especially when compared with the competing high-powered single and twin cylinder machines ridden by experts. Most of the R-S riders were novices

¶ With but one exception the **number of R-S machines which finished was larger than that of any other make.**

¶ The R-S mechanically operated Intake Valve motor stands unsurpassed —get acquainted with the R-S family—single cylinder, 3 and 4 H. P. Twin cylinders, 6 and 7 H. P.

*Write for Catalogue and Ride an R-S*

## READING STANDARD CO.

**Dept. C, READING, PA.**

# THE MILBURN LIGHT

Fig. 767A

Light in use on the Baltimore & Ohio R. R.

Fig 767B

**No. 3-X 5,000 Candle Power, Lights 1,500 Feet**

This is considered by all users to be the most perfect portable light ever devised It burns 50% air, is smokeless, incandescent and absolutely storm proof, and unaffected by vibration, wind or weather. It lights instantly, requires no attention during use. The area it covers, its many uses and extremely low cost have made it famous.

### Costs 6½ Cents an Hour

Supplied with Storm-proof Burners and 50% air feed holder. Size 12 x 36 Height from ground 6 feet. Weight, empty, 80 lbs. Packed for shipment 125 lbs. Charge of Carbide 18 lbs Cost per night 65 cents. Burning Capacity 8½ hours.

With extra Cylinder, enabling light to be recharged immediately Total weight, 107 lbs.
Complete, with Extra Cylinder .... ..... . . .... ..... ..... $101.00

Fig 767C

Extra Cylinder

### Prevention of Freezing

The Milburn Light will not freeze if Calcium of Chloride is used in the following proportions:

| Lbs. to Gal. of Water | | Degrees Below Zero | Lbs. to Gal. of Water | | Degrees Below Zero |
|---|---|---|---|---|---|
| 2½ | for | ..... 1½ | 4½ ..... | for ..... | 29 |
| 3 . . . | for | ... 4 | 5 ..... | for ..... | 41 |
| 3½ | for | ... 4½ | 5½ ..... | for ..... | 54 |
| 4 ... . . | for | ... 20 | | | |

The cost is about $1.00 per 100 lbs. Same is procurable of most manufacturing chemists.

# AIR COOLED

**CAMERON FOURS** -24 H. P., 5 models: Runabout, $950; Roadster, $985; "Featherweight Flyer," $1000; Surrey, $1050; Touring Car, $1100.

**CAMERON SIXES**—36 H. P., 4 models: Touring Car, Runabout, Roadster and Flyer—all $1500.

All prices include High Tension Magneto, full lamp equipment, etc.

**24 H. P.**

CONSIDER THE POWER IN PROPORTION TO WEIGHT

**4-Cyl. Surrey, $1050**

Rear Seats Detachable. Wheel Base, 104 in. Tires, 30 x 3½ in.

**1300 lbs.**

¶ **CAMERON AIR COOLED MOTORS** are passing through the seventh year of their development, and they stand today absolutely superior in point of efficiency and economy, to any motors on earth of same piston displacement.

¶ **CAMERON DIRECT DRIVE TRANSMISSIONS,** built integral with rear axle, show less absorption of power on all speeds than any system now in use.

¶ **CONSIDER, if you are a dealer,** that our line is complete and distinctive, and when competition is keen, as it will be from now on, this factor will be greatly in favor of our goods from a selling standpoint.

¶ **CONSIDER, if you are a user,** THE ADVANTAGE of an air-cooled motor, which will do its work successfully, regardless of climatic conditions; THE ADVANTAGE of a Direct Drive transmission system that absorbs a minimum amount of power, placed on the rear axle, giving a firm grip on the road, no matter what the surface or speed conditions; THE ADVANTAGE of a light car, eliminating tire troubles.

¶ **THE ADVANTAGE** of the combination of all these points, the sum of which is **low cost of operation.**

**36 H. P.**

CONSIDER THE POWER IN PROPORTION TO WEIGHT

**6-cyl. Touring Car, $1500**

Wheel base, 114 in. Tires, 34 x 3½ in.

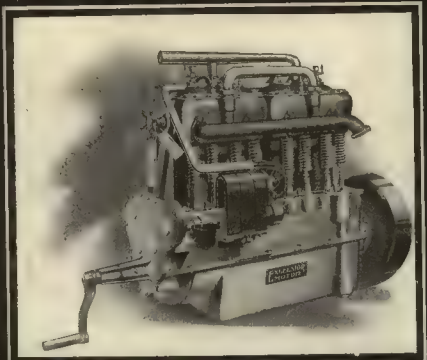
**1675 lbs.**

Our new literature is now ready; you will find it interesting. WRITE

## CAMERON CAR COMPANY

GENERAL OFFICES **BEVERLY, MASS.**

# EXCELSIOR MOTOR




## SILENT—SIMPLE—COMPACT—POWERFUL

**Not a radical departure from accepted practice, but the leading features of American and foreign construction, developed and refined through years of experience backed by a most modernly equipped and organized factory.**

Rational relation of bore and stroke. Long connecting rods.

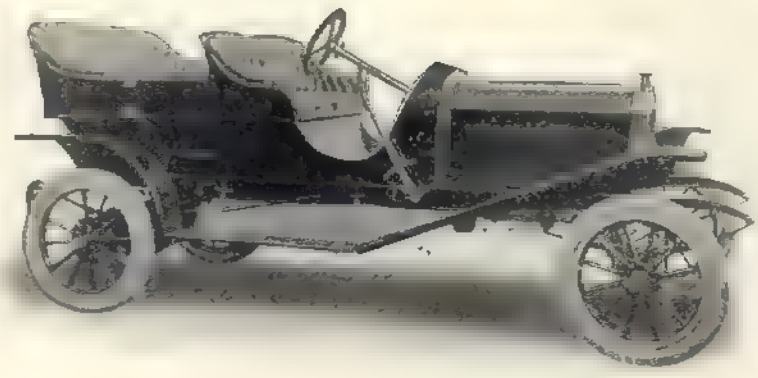
**Mechanically operated multiple jet carburettor designed for this motor exclusively. A force feed lubricating system never before used in this country. These are only a few of many valuable features**

Write for detailed information

**BRANDENBURG & COMPANY**

[illegible] 57th St., New York 319 Michigan Ave., Chicago

# Each Model a Leader in Its Class



The Lambert Car is a **good** automobile at a low price—not for one moment to be confused with **cheap** gear-driven cars.

The lower cost of the **more** efficient, simple Lambert friction transmission is what enables us to make a far better car than **any** manufacturer of gear-transmission cars can make for the same money.

In the Lambert Car, there's a full dollar's worth of automobile value for every dollar of the price—and more, too, if judged by the ordinary standards.

We said the Lambert friction drive is more efficient than gear transmission. It is It transmits **under all conditions** a higher percentage of the power generated than any type of gear transmission. It is the simplest form of transmission It eliminates gear troubles, and gear expense. It gives to the Lambert Car a smooth-running quality found in few cars.

Each Lambert model is distinguished by **other** simplicity, big value features. **Each is a leader in its class.**

# We Want Lambert Representatives

The demand for automobiles at a low price is unmistakable

The agent who represents a **good** low-priced car the Lambert —will get the cream of the business.

Lambert cars, friction driven, have the power, the speed, the endurance, the snappy style, the finish, of cars that cost half again as much.

In all territory now unoccupied we want representatives for the Lambert Car We have an unusually attractive offer to make to the right kind of men who will take up our proposition and look after our interests. We want men who appreciate and will **talk** the Lambert friction drive. Men who know enough about automobiles to recognize the fact that the Lambert Car, —each of our six models, —**is the biggest value on the market at the price.**

If you would be interested in taking up the agency question with us, write at once for full details of our proposition. In writing, you will please state what cars you are now handling and your facilities for representing the Lambert. Address—

## BUCKEYE MANUFACTURING CO.

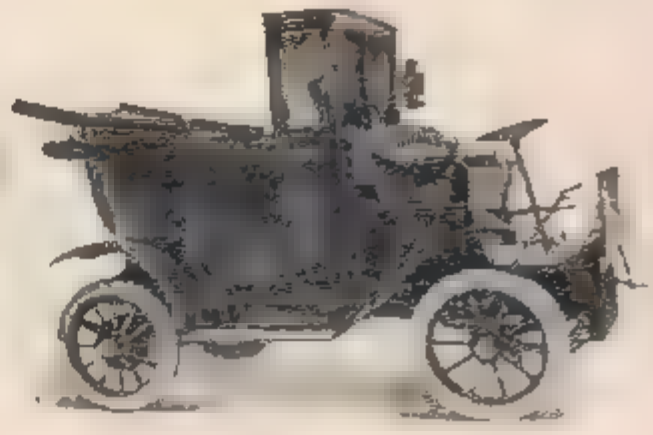
**1801 Columbus Ave., Anderson, Ind.**

# The Autocar

## Commercial Car

A standard chassis, 20 H. P., 85 inch or 97 inch wheel base, available as a one-ton truck, an open or closed delivery wagon, Taxicab, Town Car, Opera Bus, Victoria, etc. Universal utility.

**Open Delivery**



**Town Car**

Solid tires for trucks. Pneumatic for town cars, etc.
**Economical maintenance** in fuel and up-keep.
Prompt deliveries.

*Specifications and prices on application to*

**The Autocar Co.**

**Established 1897** Ardmore, Pa. **Members: A. L. A. M.**

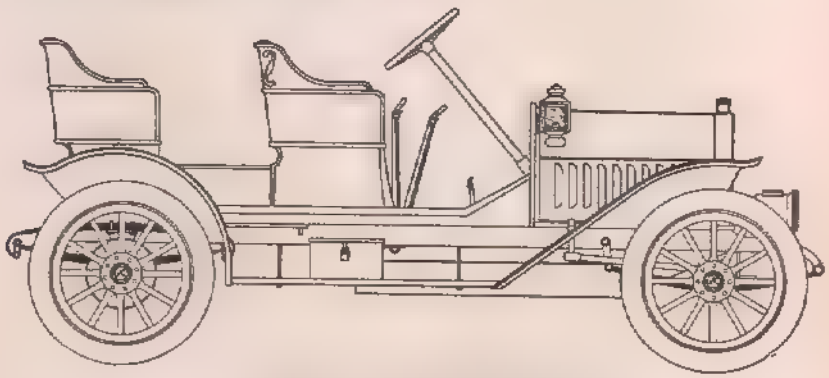
**Phila. Branch: 249 N. Broad St.**
**New York Branch: 80th St. and Broadway**

New York exhibit only at Licensed Show, Madison Square Garden, January 16, 1909.

# The Autocar

## Pleasure Car

A standardized high grade Tourabout at a moderate price. Four cylinder, four passenger---$1750.



**Type XX—1909 Tourabout**

26 horse-power (2100 lbs). Imported H. T. Magneto, front axle I Beam drop forging, semi-floating rear axle. Tires, 32 x 3½ on universal rims.

Silent—powerful.

*Deliveries in February.*

**The Autocar Co.**

**Established 1897** Ardmore, Pa. **Members: A. L. A. M.**

**Phila. Branch: 249 N. Broad St.**
**New York Branch: 80th St. and Broadway**

New York exhibit only at Licensed Show, Madison Square Garden, January 16, 1909.

Ham's Limousine

Our Handsome New Catalogue for 1909 Is Now Ready

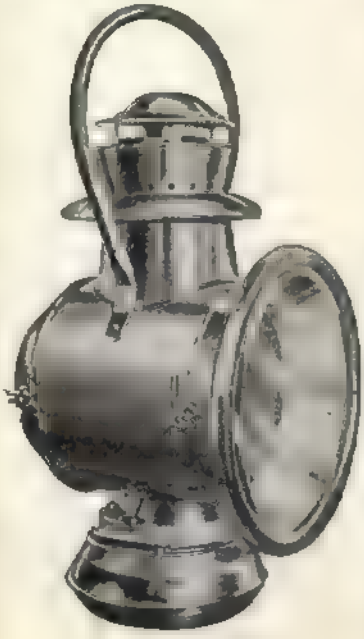
We Would Like to Send You One

Write Today

Address "Dept. D"

Ham's Tourist

# Ham's Cold Blast Auto Lamps Are Made in Rochester, N. Y.



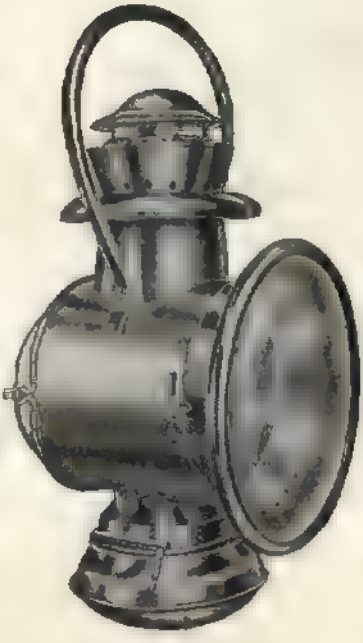
Ham's Reliance

Some of The Best Cars in the Country are Being Equipped with

**HAM'S LAMPS**

Why Not Yours?

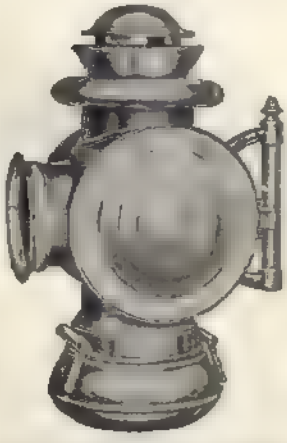
You can Get Them if you Insist



Ham's Corona

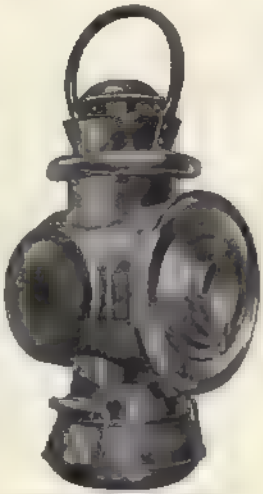
**Ham's Coupe**

Ham's Lamps are made very strong, of the Highest Grade Heavy Gauge Brass and are reinforced with Steel Plates to take the strain on the brackets. Honest Material, Honest Workmanship and Superior Burning Qualities have made Ham's "Cold Blast" Lamps Famous.



**Ham's Vigilant Tail and Inspector Lamp**

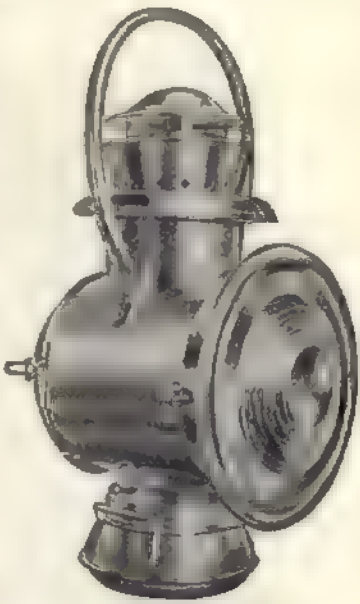
Ham's "Cold Blast" are without a doubt the finest burning Automobile Lamps on the market. They give a Clear, White, Steady Light and are Guaranteed not to Blow or Jar out.



**Ham's Mars Tail Lamp**

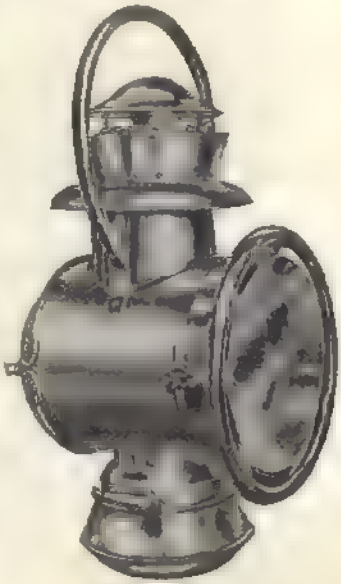
*See our Exhibit at Grand Central Palace Show, "Space 166, Section U," opening on New Year's Eve. Also Madison Square Garden Show, opening Jan. 16th.*

**C. T. HAM MFG. CO.**
**ROCHESTER, N. Y.**



**Ham's Meteor**

We have added several new and beautiful designs to our already complete line for 1909 and it will pay you to look them over and get our prices before placing your orders. We are sure we can please you.

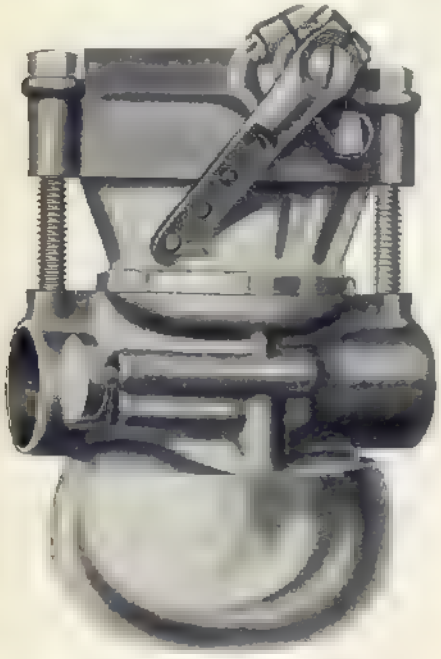


**Ham's Star**

## THE "STEWART" CARBURETOR

The Stewart carburetor is manufactured by Alfred C. Stewart, 1008 Santee street, Los Angeles, Cal. A complete description of its operation follows:

Assuming the engine to be running, the air, entering the carburetor through the inlet openings in the side of the body, raises the spraying valve until just sufficient opening is formed between the spraying valve and spraying ring to let it pass



The Stewart Carburetor

The amount of lift of spraying valve will be in direct accordance with the amount of air passing, as it must lift high enough to let it pass, but its own weight will keep it from lifting higher

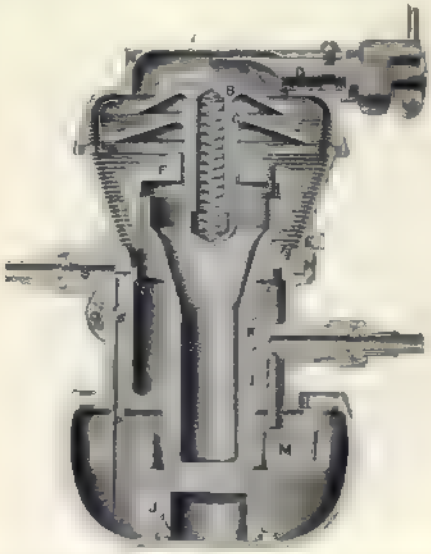
This definite position of the spraying valve, in relation to the air being drawn through, is utilized to determine the gasoline supply. The air in passing by the gasoline orifice at the base of spraying ring is constricted in its flow by the central tapered portion of the spraying valve, the partial vacuum thus formed drawing gasoline up from the float chamber and out through the gasoline orifice into the rapidly moving air, which combs it over the surface of the spraying ring where it mixes with the air.

The intermittent flow of air through carburetor, due to the successive piston strokes of the engine, would cause the spraying valve to pulsate or flutter. This, however, is prevented by allowing gasoline to flow under the stem of the valve through the small drill hole J; the stem being a nice fit in the lower part of the body it can only move at a rate which allows the gasoline to flow in or out through the small hole, allowing it to respond to any throttle change, but holding, by the slowness of its action, against any fluttering or pumping.

### SPRAYING CAPACITY

As previously mentioned the lift of the spraying valve is only according to the amount of air being drawn through. The velocity of the air past the valve will be constant regardless of the speed of the engine; no matter how slowly the engine may be running the air will pass between the spraying ring and valve at a very high velocity, due to the weight of the valve.

The gasoline flowing out of the orifice (between the ring and body) around the entire circumference of the ring is naturally in a very thin sheet or film when it reaches the rapidly moving air current. It is then carried over the surface of the ring and broken into the finest atoms, which are absorbed by the air and form a perfect gas without the aid of heat.



The "Stewart" Carburetor; Letters A, B, C D, indicate the members constituting the throttle; the guide C holding the valve B, which is opened by turning the stem D; a lever being on the opposite end to connect with handle on steering gear E is the spraying ring. The head F and stem G form the spraying valve, the only moving part in the carburetor. H is the body, the lower portion I forming a cylindrical guide for the spraying valve, the small hole J allowing gasoline to pass under stem of valve to steady its movement. The air inlet is shown at K, one on each side. The float chamber L is screwed onto the lower part of the body. Cork M being swiveled at N, swings up against valve O to close it when gasoline level is normal. Gasoline is drawn through the tube P past the adjusting screw Q into the annular space R and out through the gap between the spraying ring and body. The connection S need not be considered here, as it has no part in the normal working of the carburetor, but is for a special attachment.

### CORRECT PROPORTIONING OF GASOLINE AND AIR.

The spraying valve fitting very closely in the conical spraying ring, it is obvious that it must lift to let any air through. As it is held down by gravity alone, the amount that it will lift depends alone on the amount of air passing; so it must

always assume a certain definite position in relation to the ring and body for any given amount of air.

Now the gasoline is drawn into the air by the partial vacuum due to the central portion of the valve not allowing quite enough room for the air to pass freely. The form of this part is determined in the shop (by experiment) and is such that no matter what position the valve may be in, the air will be constricted just enough to draw in the correct amount of gasoline for that amount of air. For example: if the throttle were wide open and enough air being drawn through to raise the valve to the top of its stroke, the small part of taper would be opposite gasoline orifice and make a comparatively large opening for the air to pass through but still check it enough to make the required vacuum on the gasoline. If only a little air is being drawn through, the valve will only raise a little, and the large part of taper will be opposite gasoline orifice, making a comparatively small opening for the air, but still enough to make a slight vacuum on gasoline, as little gasoline is required for so small an amount of air.

STARTING

When engine is at rest and no air moving in carburetor, the spraying valve will rest on shoulder formed at top of body, so that no air can pass unless valve raises. A little clearance is left between valve and spraying ring, so that when the engine is turned slowly by hand, the slight vacuum formed will not raise the valve but will draw directly on the gasoline, thus flushing the carburetor. The moment the engine starts the valve will raise off from shoulder and the correct mixture will be supplied.

## NEW "PERFECT" PEDALS, ETC.

In addition to the new specialties described on page 133 of our November issue, Garage Equipment Co., Milwaukee, Wis., are including in their 1909 line three other new specialties as illustrated herewith.

The "Perfect" Locking Pedal, Style K. Style D.

The "Perfect" Locking Pedal, Style K, is designed for throttle control, horns, whistle and muffler cut-out. The pedal opens and closes the throttle freely when the toe covers the entire face of the pedal, but will lock in any position by simply sliding the toe to the right allowing the ratchet arm to spring up and the notches of the ratchet to engage the frame of the pedal, holding it firmly until released by again covering the entire face of the pedal and pressing the ratchet arm down with the toe. This pedal lists at $1.50 in black and $2.25 nickel-plated or brass.

"Perfect" Muffler Cutout.

The Style D Muffler Cut-out is made of malleable iron and clamps on the exhaust pipe after a V-shaped hole has been cut in the pipe. The valve is in a pocket at the bottom and opens inward. It will not leak, as the conical valve is held against the seat by the pressure of the exhaust in addition to the spring. The body forms a pocket to accumulate the residue and carbon from the engine, which will clear itself automatically when the valve is opened, thus preventing the clogging of the muffler. This cut-out is furnished in six different sizes to fit standard pipes. The prices range from $2.50 to $3.75.

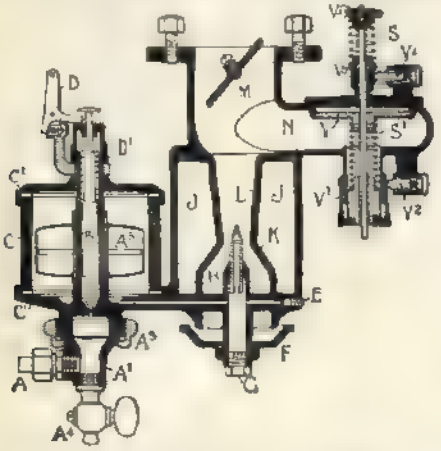
"Perfect" Emergency Mud Hook for Solid Tires.

The "Perfect" Emergency Mud Hook for solid tires is constructed so that it can be left on when out of the mud, as the total projection beyond the rubber tire is only 3-16 of an inch. It is made of malleable iron and is clamped on the wheel with a bolt. The prices run from 30 cents each for 1¼ to 1⅝-in. tires up to $1.00 each for 4-in. tires.

## STROMBERG CARBURETORS WITH GLASS BODIES

Two types of carburetors are made by Stromberg Motor Devices Co., 13th Street and Michigan Avenue, Chicago, Ill. Type A is here shown in section and Type B in both section and exterior views. In Stromberg carburetors the gasoline is supplied to the motor in a fixed ratio to the air which is automatically controlled by suction.

Referring to the sectional cut of type A it will be noted that the open spraying dome (H) is perpendicularly fixed in the mixing chamber (L) at a point where the air attains its highest velocity. Hence the gasoline is delivered in a canopy-shaped spray resulting in a high degree of vaporization even at low speeds. A large water jacket (J) surrounds the mixing chamber. The fixed air inlet is adjusted by means of cup (F). As the quantity of gasoline supplied to the motor is governed by the quantity and velocity of the air admitted



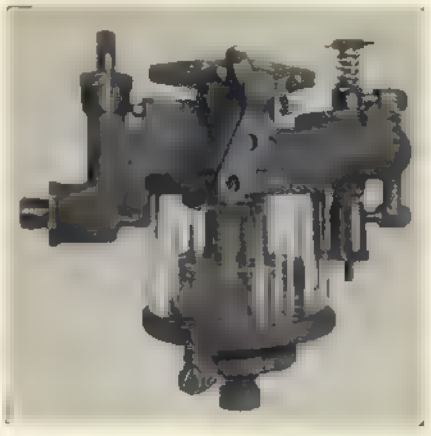

Sectional View Stromberg Type A Carburetor.

through the fixed air inlet, the carburetor may be adjusted to furnish just the proper mixture to give best results on any particular motor by proper manipulation of the springs (S) and (S-1) and the cup (F). As the ratio of gasoline and air is automatically controlled by the suction of the piston, the mixture is correct for any motor speed.

Great flexibility is obtained by the use of a sensitive auxiliary air valve (V) which is controlled by two springs (S-1) controlling the valve at slow and medium speeds and (S) at high speeds. These springs are adjusted by means of locknuts (V-1) and (V-3) which have grooves in their sides and are held securely in position by plunger (V-2) and (V-4). The spring (S-1) is so proportioned that the slightest opening of the throttle valve (M) produces a corresponding opening of the air valve (V).

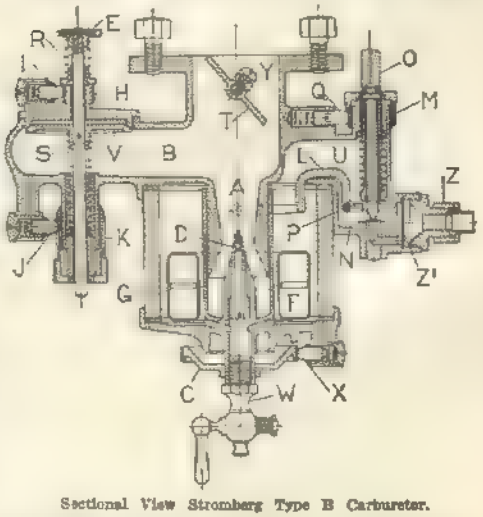
To make engine starting easy this carburetor is provided with a priming arrangement consisting of a lever (D) which when raised lifts the gasoline valve (B) causing the gasoline to rise and overflow the spraying dome (H) into air cup (F). Hence the engine draws gasoline not only from the spraying dome but the air cup and gets a very rich mixture

The gasoline chamber is of ample size and a large and substantial metal float (A-5) is used. The needle valve (B) is



Exterior View Stromberg Type B Carburetor.

also of substantial proportions and has a balancing spring (D-1). It has a ground seat. To avoid the possibility of particles of foreign matter getting under the valve a gauge screen is fitted in the coupling joint (A-3). The float chamber is provided with a specially made Macbeth nonbreakable glass wall, ¼ inch thick. Specially constructed cork gaskets top and bottom insure against leakage. This glass




Sectional View Stromberg Type B Carburetor.

gasoline chamber is one of the exclusive features of the device and enables the operator to observe the fuel level and workings of the parts at any time. All parts of the carburetor are interchangeable and readily accessible. Fives sizes of Type A, (1, 1½, 1⅛, 1¾ and 2-inch) ranging in price from $22.50 to $45.

# The Mora Light Four

The Mora Motor Car Co., Newark, N. Y., are placing on the market for the season of '09 a model known as the Mora Light Four, which is shown in Fig. 1. This car can be had either as a racytype model, having two front seats for passengers and two individual adjustable detachable rear seats, also as a limousine, or as a close coupled tonneau, as shown.

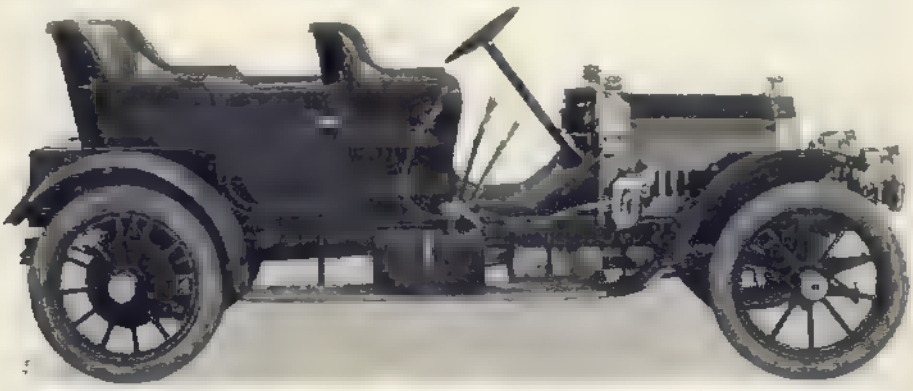


Fig. 1. Mora Mechanically Right Light Four motor, 4-inch bore, 5½ inch stroke, integral crank case pan construction, leather faced cone clutch, three speed selective change gear, mounted on annular ball bearings. All parts of power plant accessible from above, protected from dirt on the under side shield. Dixie, jump spark ignition, using imported magneto and storage battery are supplied on the $2[illegible] model.

The characteristic Mora features, such as aluminum pan crank case construction combined with the change speed mechanism, is retained, being similar in nearly every respect to the power plant construction which was used in last year's model, which captured the world's Sealed Bonnet record. Several refinements have been made, and a thoroughly tested and tried-out annular ball bearing selective transmission is now used. The wheel base is 110 inches and the tread standard.

POWER PLANT

The aluminum pan unit construction that proved so satisfactory in the four-cylinder models for the past three years is retained in this car. This is the same power plant that was used in the car of last year which captured the World's Sealed Bonnet Record, but has been refined and coupled with a thoroughly tested and tried-out annular ball bearing selective transmission

The motor has a 4-in. bore and 5⅛-in. stroke, and is rated as 24-28 H. P. The cylinder valve and manifold construction are plainly shown in Fig. 2. The crank shaft is of the three-bearing type, and all these bearings are supported on the base of the pan and are of very liberal dimensions.

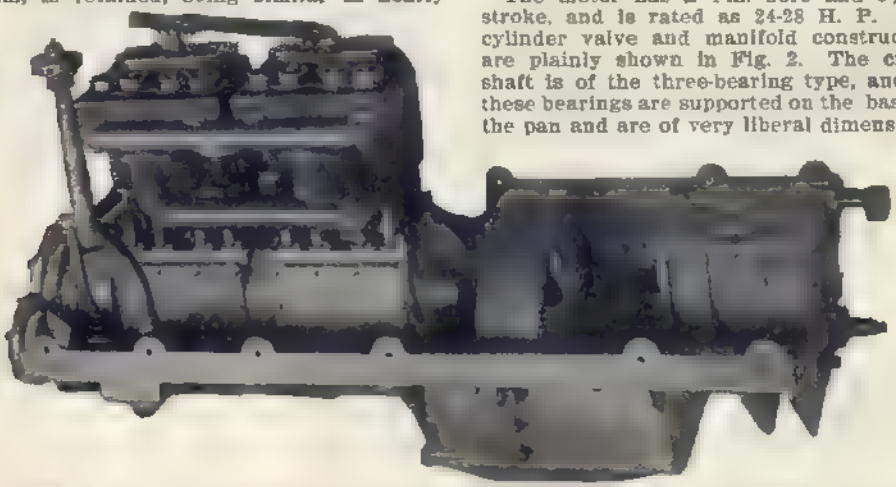


Fig. 2. View of the Mora Light Four unit power plant with integral pan. This construction is practically the same as has been used for the past three years with marked success, and was the construction used in the world's record Sea. Bonnet car. Cylinders cast in pairs, valves on one side, four-inch bore, five and one-eighth stroke. Rated as 24-28 H. P.

The bearing at the rear end of the crank shaft measuring 4 inches in length, middle and front bearing 3⅛ inches. The pistons are unusually long and are bronze bushed for the piston pin, which is held fast in the rod by a tapered bolt.

Lubrication is by splash, the oil being

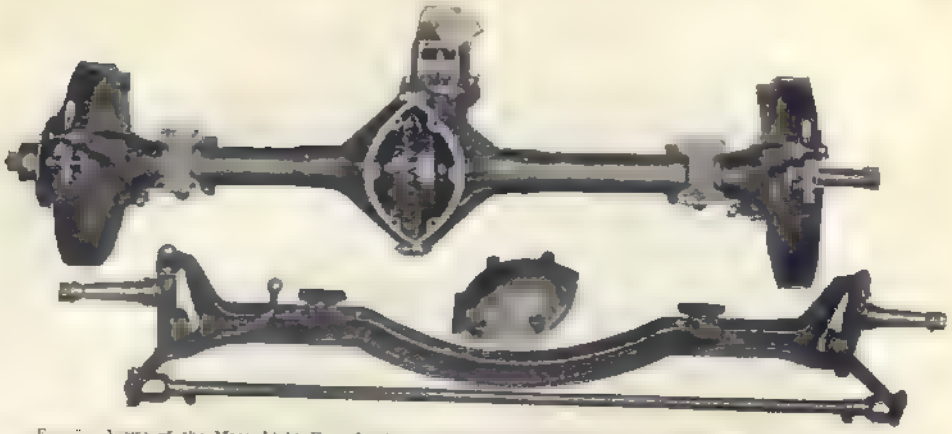


Fig. [illegible] Views of the Mora Light Four front and rear axle. Differential is of the bevel gear type mounted on special ball bearings. An adjustment is provided for the bevel pinion. Double set of brakes acting on 14-inch diameter drums are provided. Front axle is an I beam drop forging with applied spring [illegible]

fed by a pressure oiler through two sight feeds on the dash to the compartments of the crank case. A third sight feed is furnished which ordinarily is closed, but may be opened wide to raise the oil line

Fig. 4. Detail of brake construction on the Mora Light Four showing internal expanding and external contracting band brakes.

in the crank case should unusually heavy going render this necessary. The cooling water circulation is by gear pump. The clutch is a leather faced cone of ordinary type.

CHANGE GEARS

A three-speed selective change gear is lined up with the motor by fitting in ways machined in the rear end of the aluminum pan power plant support, which pan has always been a feature of the Mora cars.

Fig. [illegible] Details of the Mora Square Block Slip Joint. This does not [illegible] a fore and aft direction but is square on the [illegible] of rotation and slides in the hollow case shown, thus forming a universal and slip joint.

It acts as a support for both motor and transmission, taking the place of a subframe as found in most cars. It serves in keeping motor and transmission in perfect and permanent alignment. It acts as an absolute mud protector. Everything about the power plant can readily be gotten at from a standing position.

The transmission of power to the rear axle is through a hardened steel block, square in the direction of rotation and

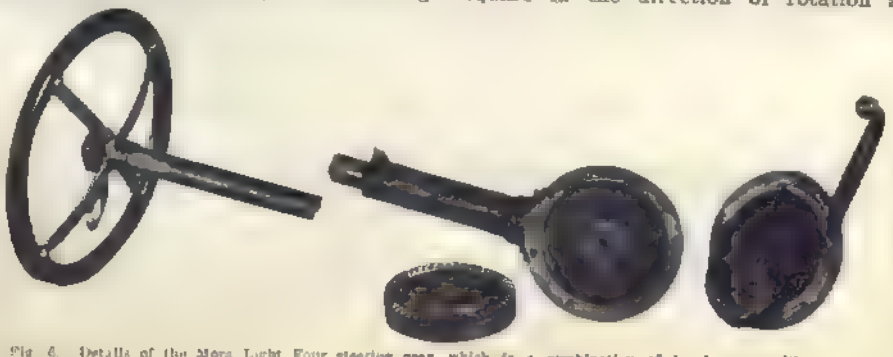


Fig. 6. Details of the Mora Light Four steering gear, which is a combination of bevel gears with an internal gear and pinion

rounded fore and aft. This slides in a square hole in a hardened steel casing fixed to the change gear shaft

THE AXLES

The rear axle has four pitch-driving bevels mounted on special ball bearings A neat adjustment is provided for the bevel pinion. The brakes are all on the rear axle and act on drums 14 inches in diameter. They are operated through long equalizers sliding in slots in the frame The front axle is a one-piece drop-forged I-beam, and the wheels are fitted with ball bearings. The front springs are semi elliptic and the rear are of the ¾ semi-elliptic platform type. The emergency brake is interlocked with the clutch, but the foot brake is not interlocked Steering is by a combination of bevel gears with an internal gear and pinion. By the use of a drop pressed steel frame practically a direct drive is secured to the rear axle

A specially designed carburetor is used. It has a single nozzle concentric with the float. The regular air supply passes through holes in the side of the nozzle chamber, and a cylindrical shutter may be operated to close these holes for starting. Auxiliary air is admitted through a spring-retained poppet valve

Ignition current supply is from storage battery through a four-unit coil, or from a magneto. When the car is sold at $1,850 it is supplied with the battery system only, but when sold at $2,000 the motor is supplied with a double set of spark plugs and the car is equipped with both storage battery and an imported magneto, and the ignition system is then double and strictly independent

# 1909 Schacht Auto-Runabout

P. S. TICE.

The Schacht Manufacturing Co., Cincinnati, Ohio, are now turning out their 1909 Auto-Runabout. This car is built in but one size wheel base, 74 inches, but may be had with 4 feet 8 inches or 5 feet tread, at the option of the purchaser. The car is of the same high-wheel type that has been built by this Company for several years past and is offered for the coming season at $680 with 40-inch wheels and solid rubber tires; and at $740 when fitted with 36-inch pneumatic tires

The running gear, which is worked out in a quite original manner, combining automobile and buggy practice, comprises the front and rear dead axles, each 1¼ inches square forgings, to which the wheels are fitted on Timken roller bearings two long flexible, hickory reach rods maintaining axle parallelism, a pair of side springs equal in length to the wheelbase, and a unique shackling system for the springs ends.

Four brackets are clipped to each axle and supported by them is a rod above the axle and parallel with it the ends of which form the journals of the suspended spring shackles which carry the two longitudinal springs. Adjustable radius rods link the rear axle to the driving jackshaft, as shown later, and, because of the hickory reaches, serve to maintain the relationships of both axles with the body sills, to which are attached the power plant,

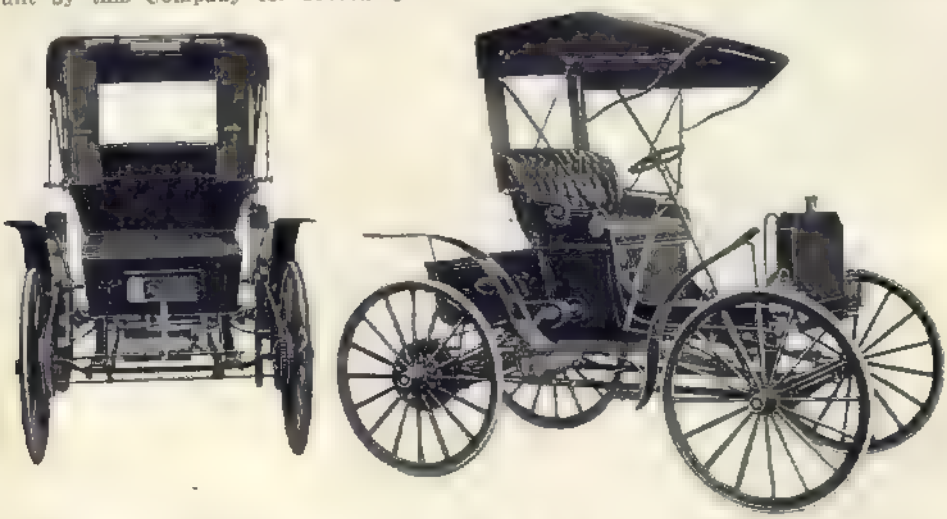


Fig. 1. The Schacht Auto Runabout, Model K, showing the side and rear view. This car is fitted with a [illegible] 15-24 H. P. Davis water-cooled engine placed crosswise at the rear under a hood which [illegible] to the lines of the body. Drive is by friction wheel and disc to countershaft thence by side chains. Price with [illegible] wheels and solid tires, $650. Fully equipped [illegible] fitted with 36-inch pneumatic tires.

# What More Do You Want That You Don't Get in This Car—Price $1500

If you ever owned a car you can appreciate this Mitchell 30 at $1500.
It's not hard to convince an "automobile-wise" man that in this car you get a greater value than in any other car at even a greater price.

And if you are now "investigating the automobile market" for the first time read this advertisement.

It will show you that $1500 is all you need pay for a car that will fill every requirement you have for a five-passenger automobile and incidentally save you from $500 to $2000.

This Mitchell 30 is not a sensation
Sensations cease to be sensations when they become practical everyday happenings.

The Mitchell is not the result of a new discovery that a "good" automobile can "probably" be made to sell at $1500. The Mitchell is a development—not a discovery—of eight years automobile building.
It has always been a low price high-quality car.

Therefore the Mitchell 30 will not be found to be weak or constructionally wrong before the season is over, necessitating a change in either design or material.

There won't be any necessity to rebuild the Mitchell motor because of insufficient crank shaft bearings, too small valve openings, not sufficient cooling surface or for any other reason.

The Mitchell 30 motor has been in use on thousands of cars—all Mitchells'—for four years.

There is no longer any need for experimenting.

Can you trust the theoretical, but undemonstrated idea of even the greatest gas engine builder?

Your money goes into the car. You are the one to be inconvenienced by a broken crank shaft because there were only two bearings instead of five as on the Mitchell. Good designers must experiment before they arrive at perfection. We did that years ago. We began making low-price automobiles when we started. Eight years experimenting are back of the Mitchell. You won't have to experiment for us. It's impossible to say what might happen if you drove a theoretically-right car that has not shown its worth on the road.

No one knows what an automobile will do until it's tried.

We drove a car 110,000 miles before we discovered that the gas-pipe torsion rods used on most cars, regardless of price, should be replaced by solid steel.

That's just an instance.
A broken torsion rod might be unpleasant—even dangerous, but unless the break happened while running fast it wouldn't be so bad.

But suppose you started up-hill on "high" and couldn't make it. A two-bearing crank shaft might snap. It takes time and costs a lot to fix a broken crank shaft.

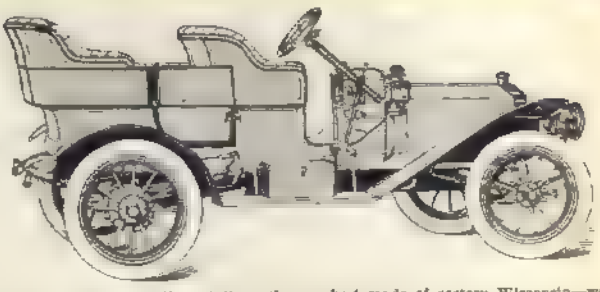
Other makers are experimenting upon nearly all parts of their cars for they are now in their first year of experience in the building of low-priced cars.

You probably know a Mitchell owner. There are 8000 of them.

They are our demonstrators. They know more about Mitchell cars than our agents. Ask an owner to tell you about the Mitchell. Then you'll know.

That's better than what any maker thinks about his car

# Here Are a Few of the Details



Take one example of the difference between the proven Mitchell and any other car.

The best motor car theory is that the water pump should be driven at half the speed of the engine.

We made Mitchell water pumps that way at first—eight years ago.

But when the Mitchell got in common use on the deserts of Nevada, there was trouble with hot cylinders.

On those boiling desert sands, where the water heats while the car is standing still, it takes more to cool a car than it does on the boulevards of Chicago.

So we made a radical change from the 'best motor car practice'—we forsook the kind of knowledge on which "paper" cars are built—and we doubled the speed of the water pump.

Since we geared the water pumps to go at full engine speed there has been no more trouble with heated cylinders—even on the hottest days and in the deepest sands that the deserts of Nevada know.

And the result is that there are only two cars which today are in common successful use on those desert sands—one a car that costs more than three times the Mitchell price—the other, of course, the Mitchell.

* * *

You may not want a car for desert riding. You may not want a car for mountain climbing. But you can be sure of a car when it stands such tests as these.

* * *

And as with the water pump and the crank shaft, so with the transmission, so with the clutch, so with the rear axle, so with the lubrication, so with the brakes, so with every part of the Mitchell car.

* * *

In the Mitchell you will find perfections, refinements, superiorities of the kind that come only with experience—perfections, refinements, superiorities that no "paper" car, no matter how skilled its maker, can possibly have.

* * *

But if the makers of other cars know all these vital things which eight years of experience in building low-priced cars have taught us—they would not, even then, make so good a car as the Mitchell at $1500.

The cost of making the special dies and tools, alone, would prohibit it.

If we had to begin at the beginning, as they do, this new Mitchell 30 would cost you $1000 more.

It is only because our dies, special tools and initial expenses were paid for and charged off, years ago, that we can give so good a car for so small a price.

The $1500 you pay for a Mitchell 30 goes not into dies and special tools—it goes into material, workmanship, testing—it goes into the car you get.

* * *

It is not enough for us to know that our design is right, that our material is perfect, that our workmanship is of the best.

It is not enough for us to know that the $1000 cars that we have made are right.

We must know that the particular car you buy is right.

So we test it as though we were making a car a year, instead of fifteen cars a day.

We test it on the roughest roads of eastern Wisconsin—we give it actual road punishment of from 100 to 250 miles—over hills—through sand—on straight stretches—the kind of a test you would give it if you were testing it yourself.

* * *

Compare this four-cylinder, five-passenger $1500 Mitchell with any car—with the best American cars, no matter what their cost or pretensions.

You will not find in any of them more vanadium and nickel steel. You will not find more perfect engines. You will not find a proven superiority which this $1500 Mitchell lacks.

This $1500 Mitchell is an imposing looking car.

It has a wheel base of 105 inches. The body is wholly of metal. The upholstering is luxurious. The wheels are big—32 inches—fitted with detachable rims and four-inch tires.

The engine is housed under a big handsome hood. The four cylinders are cast separately, as the best engines always are. 28-30 horse power.

Aluminum castings are employed wherever possible—only we go to the trouble and expense of strengthening them with bronze where there is wear and strain.

There are two complete ignition systems—the magneto, geared direct to the engine and a regular battery system.

The lubricating system is the best that we have found in eight years of experience—certain in operation, "non-leak" in oil.

The transmission is of the selective sliding gear type—as in $5000 to $7000 cars.

The battery and tool boxes, made of baked enamel steel, are furnished without extra expense to you.

The tonneau is detachable—and you have your choice of either tonneau, surrey body, rumble seat roadster, or runabout deck at the $1500 price.

Complete specifications and photographs of the working parts will be gladly sent.

Don't buy any car till you know all about this wonderful $1500 Mitchell 30. Please use the coupon.

**Will exhibit in New York only at Grand Central Palace Auto Show opening New Year's Eve.**

**Mitchell**

**New Model 30 (1909 model) including High-Grade Magneto—32x4 in. tires—assuring freedom from tire troubles and $300 worth of actual extra Automobile value which you can get in no other car of its price. Touring Car or Roadster—price,**

**$1500**

**MITCHELL MOTOR CAR CO.**
**503 Mitchell St., Racine, Wis.**
*Standard Manufacturers, A. M. C. M. A.*

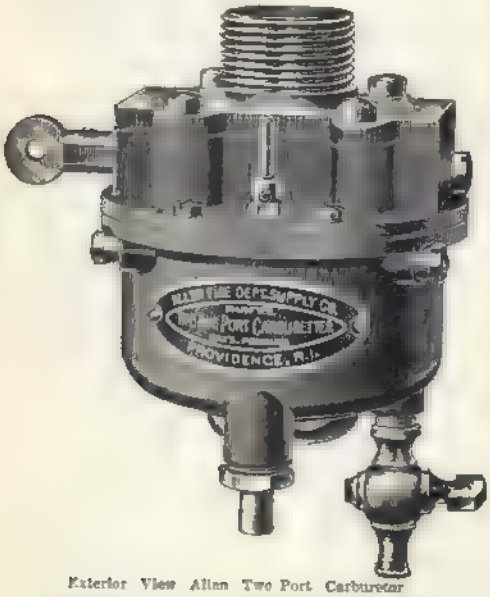
You may send me a detailed description of your new $1500 Mitchell 30.

*Name* _____

*Address* _____

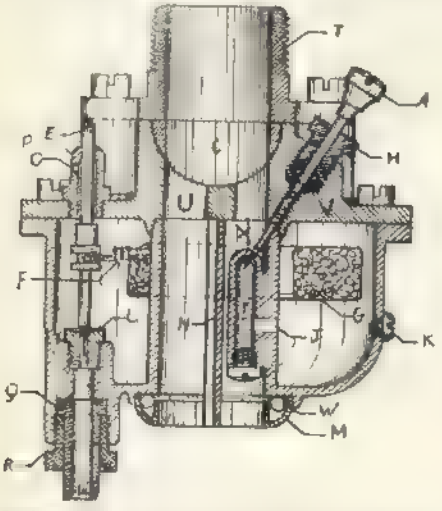
## A CARBURETOR WITHOUT VALVES

Allen Fire Department Supply Co., Eddy and Friendship streets, Providence, R. I., have brought out a carburetor with several distinctive features which tend toward simplicity and strength.




Exterior View Allen Two Port Carburetor

This carburetor is of compact design, float-feed type, and consists of two ports, (N) an auxiliary air port and (X) the carburetor port which contains the gasoline stack (I). Each of these ports is free, not having any valves whatsoever. The air is taken in at the bottom, one side having




Sectional View Allen Two-Port Carburetor; the carburetor port X contains the gasoline stack and the other port, N is an auxiliary air port, both ports are free and contain no valves.

thick mixtures, the other side being auxiliary air and at the point near (C) form the necessary mixture of proper proportions to meet the requirement of the engine. It will be noticed that there are no butterfly valves or springs whatsoever. A slide at the top after it has been set is positive and remains in that way at all times.

The float in the bowl is hung on a pivoted arrangement so that one gasoline level will be maintained at all times.

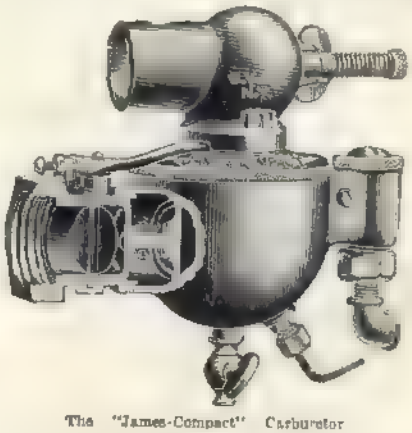
The needle (A) is made of German Silver with a German Silver seat. There are proper arrangements made for drawing off all sediment or dirt that may collect in all parts of the carburetor. At the bottom of the carburetor is a reservoir and the gasoline that is retained therein serves in starting the engine.

The sectional cut displays most of the features of this carburetor. A is the gasoline needle; C, the throttle hole; E, the float needle; F, the float lever; G, the float, H, packing gland; I, gasoline stack; J, gasoline inlet from chamber; K, screw plug for cleaning; L, seat of the float needle; M, gasoline puddle ring; N, auxiliary air port; O, air vent; P, float needle bushing; Q, swivel nipple; R, lock nipple; T, connecting screw; W, auxiliary port in cover, V, cover; W, spiral spring; X, carburetor port.

## "JAMES-COMPACT" CARBURETOR

The "James-Compact" float feed carburetor is one of the latest products of the Generator Valve Co., of 294 Taaffe Place, Brooklyn, N. Y., and is, we are told, meeting with much favor in the trade. The list prices range from $13.75 for the ¾-in size to $26 for the 1½-in. size. Special prices are quoted to engine builders for quantities.

This carburetor has the check valve inside of the body near the gasoline nozzle so that when the mixture is formed at that point there never can be any waste



The "James-Compact" Carburetor

of same before check valve opens. The check valve is made of a special bronze metal which will stand the hardest of wear, and can be easily taken out and reground by unscrewing the bolts which connect the carburetor to shank for engine connection.

# For 1909 The INDIAN MOTOCYCLE

WILL MEET EVERY DEMAND IN PRICES, MODELS, POWERS

2 MODELS. 7 DIFFERENT MACHINES

## CHAIN OR BELT DRIVE

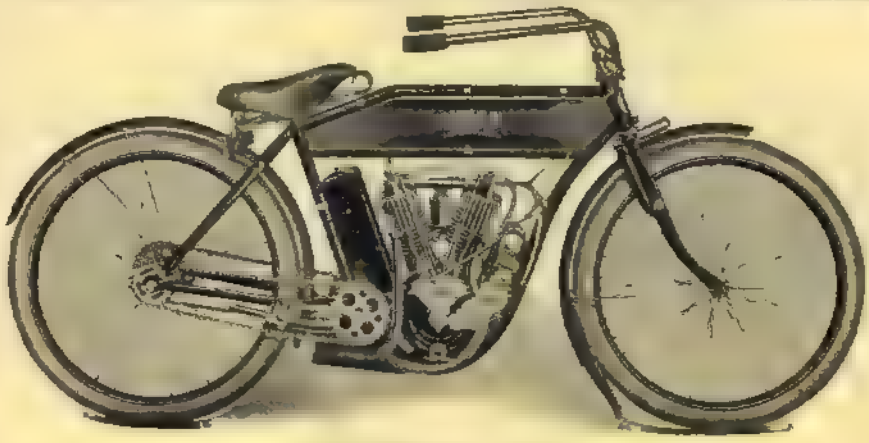
THE NEW MODELS are Handsomer, Better, Faster Than Any Ever Shown Before

LIBERAL TERMS TO SALES AGENTS
Who are Loyally Protected

There will be more money in motocycles than in automobiles for those who get in early and right. The machine that advertises itself is the best advertised and the easiest to sell. The INDIAN has LED EVERYTHING for 7 years. GET THE LEADER.

**Hendee Manufacturing Co.**
**Springfield, Mass.**

# The Indian Holds All Records for Speed, Endurance, Reliability, Hill Climbing



**1909 TWIN, 38.61 (5 H. P.)**

**SPECIFICATIONS FOR 38.61 (5 H. P.) LOOP FRAME TWIN**

MOTOR: Hedstrom improved, air cooled. Stroke, 3¼, bore, 2¾ inches

VALVES: Mechanically operated by new mechanism. New exhaust valve.

CARBURETOR. Hedstrom improved, automatic, compensating, specially remodeled.

CONTROL. Indian patent leverless, double grip, "twist of the-wrist" system. Right grip controls spark advance and exhaust valve release, left grip controls throttle.

MUFFLER. Indian latest improved. Smallest and most efficient ever produced. Fitted with cut out operated by foot, giving complete release.

SPEED. Five to sixty miles an hour. Variations according to gear used.

FRAME: Special steel tubing REINFORCED THROUGHOUT ITS LENGTH. Height, 19 inches.

WHEEL BASE. Fifty-three inches, contributing to steadiness at all speeds.

FORKS: Indian patented, double spring, convertible cushion forks. Seamless tubing, thoroughly reinforced. Fork crown and hinges, drop forgings.

WHEELS: Twenty-eight inches; 36 spokes front and rear.

RIMS: Hollow steel, finished to match frame.

GUARDS: Improved wide mud guards front and rear. Front guard provided with splasher.

TIRES: G. & J. improved, moulded, 2½ inch detachable.

IGNITION: High tension magneto

SPARK PLUGS: Hedstrom perfection mica plugs.

TRANSMISSION: Indian patent roller chain drive, with compensating sprocket. Chains and sprockets efficiently protected by guard. Option, direct V belt drive.

BRAKE: Corbin Indian SPECIAL COASTER BAND BRAKE.

SADDLE: Imported Brooks B 100-5 motocycle saddle, with compound springs. Options, B-100-4, B-90-4.

TANKS. Gasolene capacity, over two gallons. Improved sure tight gasolene cut-off built into tank. Oil capacity, two quarts.

OIL GAUGE. Direct sight, opening to improved oil reservoir in base.

FINISH: Royal Indian blue, all bright parts nickeled on copper. Options, Indian red or Indian green.

WEIGHT: One hundred and fifty-five pounds.

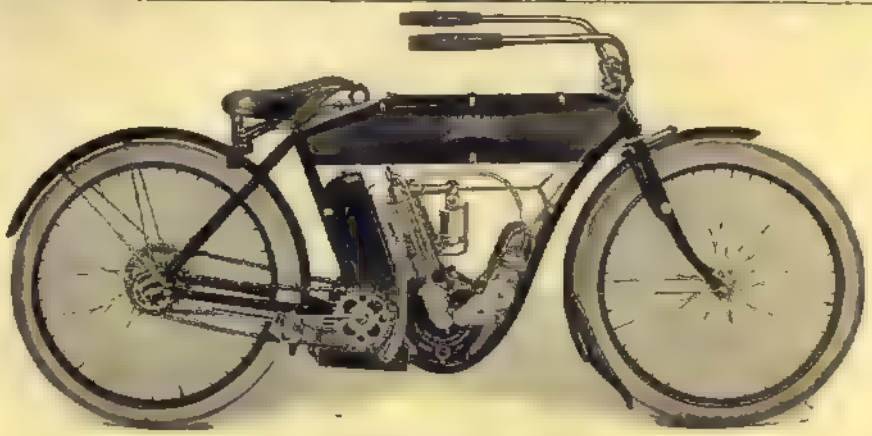
TOOL BAG: Indian improved square bag, containing all necessary tools, oil can and repair outfit.

For prices, see succeeding page.

**Hendee Manufacturing Co., Springfield, Mass.**

# The Indian Holds Every F. A. M. Championship

## Won the Great New York–Chicago Long Distance Touring Contest



**1909 SINGLE 19.30' (2¼ H. P.)**
**Showing Characteristics of all Single-Cylinder Models**

**SPECIFICATIONS FOR 1909 LOOP FRAME SINGLE-CYLINDER INDIAN 19.30' (2¼ H. P.), and 26.96' (3½ H. P.)**

MOTORS: Hedstrom, improved, air cooled. 19.30', Stroke, 3¼; bore, 2¼ inches. 26.96', Stroke, 3¼; bore, 3¼ inches.

VALVES: Mechanically operated.

CARBURETOR. Hedstrom, improved, automatic, compensating carburetor

CONTROL Indian patented leverless, double grip, "twist-of-the-wrist" system Right grip controls electrical spark and exhaust valve release; left grip controls throttle.

MUFFLER Indian latest improved. Smallest and most efficient ever produced. Absolutely noiseless. Fitted with cut out operated by foot, giving complete release.

FRAME New improved loop model. Special steel tubing REINFORCED THROUGHOUT ITS LENGTH. Height, 19 inches.

FORKS Indian patented, double spring, convertible cushion forks Seamless tubing, thoroughly reinforced Fork crown and hinges, drop forgings

WHEELS: Twenty-eight inches, 36 spokes both front and rear.

RIMS: Hollow steel, finished to match frame.

GUARDS Improved wide mud guards front and rear. Front guard provided with splasher.

WHEEL BASE. Fifty three inches, contributing to steadiness at all speeds.

TIRES: G. & J. improved, moulded, 2½ inch detachable.

IGNITION No 6 dry batteries. Optional, special magneto, $25 00 extra.

SPARK PLUG: Hedstrom mica plug.

TRANSMISSION Indian roller chain drive, with compensating sprocket Chains and sprockets efficiently protected by guard. Option, direct V belt drive. (The 2¼ H P machine will be supplied with chain drive only.)

BRAKE Corbin Indian SPECIAL COASTER BAND BRAKE

SADDLE: Imported Brooks B-100-5 motocycle saddle, with compound springs. Options, B 100-4, B-90-4.

TANKS. Gasolene capacity, over two gallons. Improved sure tight gasolene cut-off built into tank. Oil capacity, two quarts.

OIL GAUGE Direct sight, opening to improved oil reservoir in base.

FINISH Royal Indian blue; all bright parts nickeled on copper. Options, Indian red or Indian green.

WEIGHT: One hundred and fifty-five pounds.

TOOL BAG Indian improved reinforced square bag, containing necessary tools, oil can and repair outfit.

For prices, see succeeding page.

**Hendee Manufacturing Co., Springfield, Mass.**

# Attractive Features
## For Both Sales Agent and Buyer

## PRICES

### 1909 Loop Frame Models

| | |
|---|---|
| 19 30" (2¾ H. P.) Single cylinder Battery Ignition | $200 00 |
| With magneto | 225.00 |
| 26 96" (3½ H. P.) Single cylinder Battery Ignition | 225 00 |
| With magneto | 250 00 |
| 30 16" (4 H. P.) Single cylinder magneto only | 275 00 |
| 38 61" (5 H. P.) Twin, magneto only | 275 00 |
| 50 32" (7 H. P.) Twin, magneto only | 325.00 |

**Chain or Belt Drive Except the 2¾ H. P. which will be Built in Chain Drive Only**

### 1909 Diamond Frame Models

**Chain Drive Only; Battery Ignition Only**

| | |
|---|---|
| 19 30" (2¾ H. P.) diamond frame | $175 00 |
| 38 61" (5 H. P.) twin diamond frame | 225.00 |

Auxiliary tank and rear seat position extra

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## We are Sole Agents for
# BROOKS' CELEBRATED SADDLES
## For Bicycles and Motocycles
**Best in the World**

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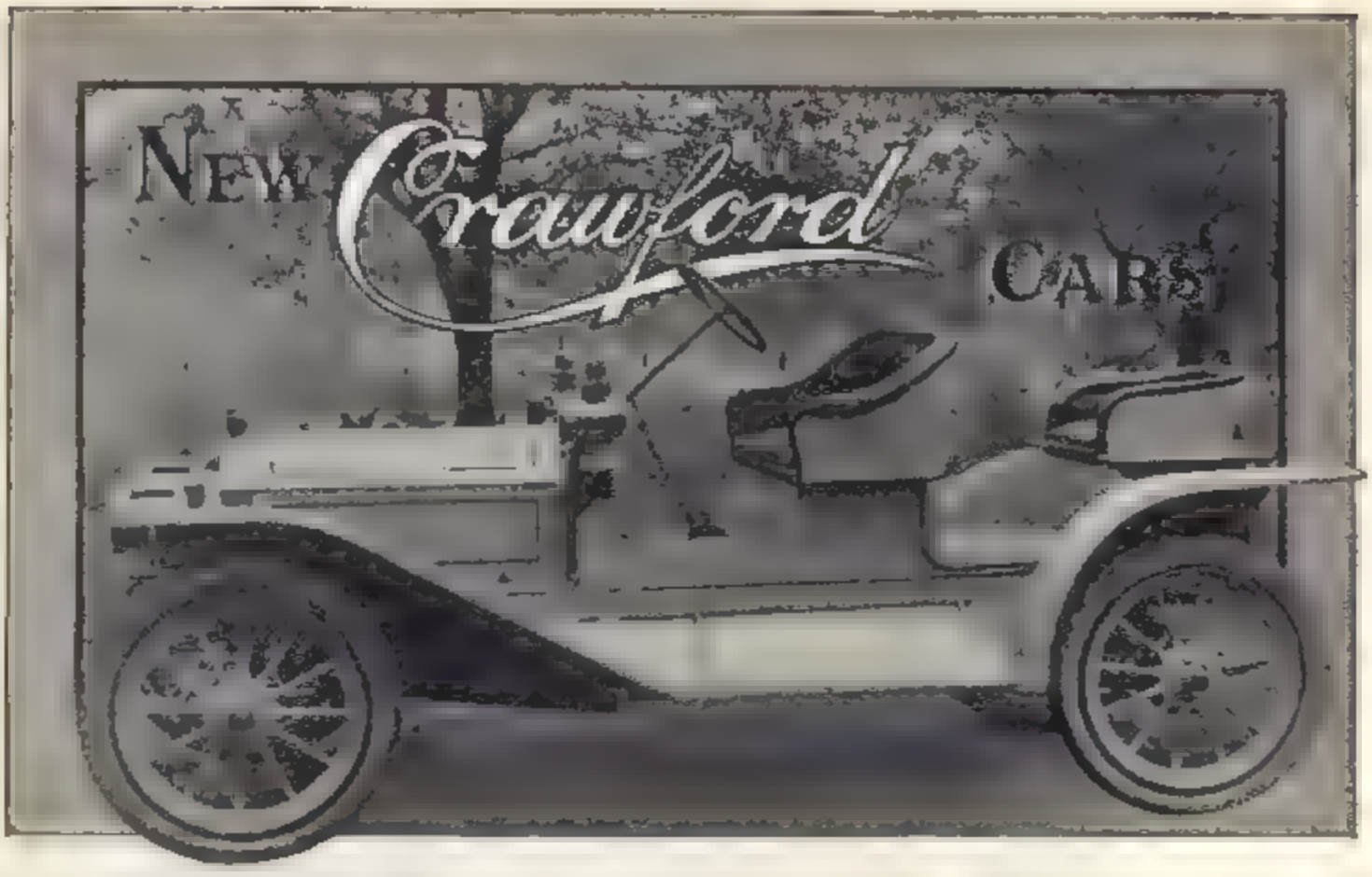
# HENDEE MANUFACTURING CO.
## Springfield, Mass.




As usual, the Crawford Automobile Company, Hagerstown, Md., offers for the season of 1909 a complete line of gasoline cars, ranging from an entirely new $1,250, 4-cylinder, shaft-driven runabout up to a large 50 H. P. side chain driven 7-passenger car. For several seasons the Crawford cars were driven by means of a side chain to each of the rear wheels, but for 1908 two entirely new high-power, shaft-driven models were added; and for this season, in addition to these models, a new small shaft-driven car, known as Model H, is being placed on the market. This new model has a 4-cylinder, 25 H. P. motor, and is fitted with either a single or double rumble seat, or with a baby tonneau, which will comfortably seat three, making the seating capacity of this little car five.

The former models that is, Model G and Model D, have been carried over for this year with a few minor detail changes. Model G is a 40 H. P. touring car with seating capacity for five. This car is shaft-driven and sells for $2,000 as a touring car, $3,750 as a landaulet, or both bodies can be had for $4,000. Model D has practically the same power plant and general chassis specifications, but being a runabout the seat is placed further back, steering post given greater rake, and a single or double rumble or a baby tonneau can be had at the same price as the Model G—$3,000. If two bodies are ordered an additional price is charged. The remaining car is Model F, a large 50 H. P. double side chain, seven-passenger machine, which has been but very slightly modified during the last three seasons.

### MODEL G CHANGES

The general specifications of Model G are 4 cylinders, water cooled, 5 x 5, 40 H. P. Crawford motor, force feed lubricator, double ignition system using magneto, multiple disc clutch, sliding gear selective type change speed mechanism, giving 4 speeds forward and 1 reverse, direct on the third speed. The gears are nickel steel and mounted on ball bearings. The car is shaft-driven, has 114 in. wheel base and is fitted with Goodyear quick detachable rims. The change speed gear lever operates on the selective principle, the concentric tube, which has a transverse motion giving gear selection, is mounted on steel balls which operate in longitudinal slots milled into the tube. This special mechanism, which was completely described in the February, 1908, issue of the Trade Journal, page 89, has been found to work perfectly and is fitted without change. The straight line type of body has been increased in length about six inches, giving more leg room. The springs remain the same, both being of semi-elliptic type, but the driving force of the rear wheels is now through strut rods from the ends of the rear axle, their forward ends being ball and socket supported on the brake rod hangers. Both ends of the spring are now shackled and are free to move, as they do not transmit any of the driving force of the wheels to the frame. Thirty-four inch wheels with 4 in. tires are used, as on last season's model. The cowled or hooded dash has been supplanted by a plain brass-edged dash, this being more in keeping with the straight line type of body. The forward time gear case has been redesigned and somewhat improved, so that dripping of oil is impossible. The lower half of the case is now integral with the lower part of the crank case. A slight modification has also been made in the con-

struction of the valve lifting rods, the lower ends of which are fitted with hardened steel rollers. The portion of these lifting rods which bear most heavily against the guides has been fitted with bushings to take the wear due to the side thrust of the cams. This bushing is in the form of a cylindrical sleeve enclosing the roller, with the exception of the lower portion, which bears on the cam. These detail changes, with the exception of the tires, apply also to the Model D runabout.

The Model F, which is the largest of the cars, having a 5 x 5½, 50 H. P., 4-cylinder, water-cooled motor, is the only chain-driven model now manufactured by this company. This car has been so satisfactory that it will be continued without change for 1909. It is fitted with double ignition, force feed lubrication, multiple disc clutch, sliding gear which is of selective type, giving three speeds forward and one reverse, double side chain drive 34 x 4 in. front and 34 x 4½ in. rear tires, with Goodyear quick detachable rims. The wheel base is 118 in. and the tread 56 in. The price of this seven-passenger model with touring body, is $3,250, as a limousine $4,250, or $4,500 with both bodies.

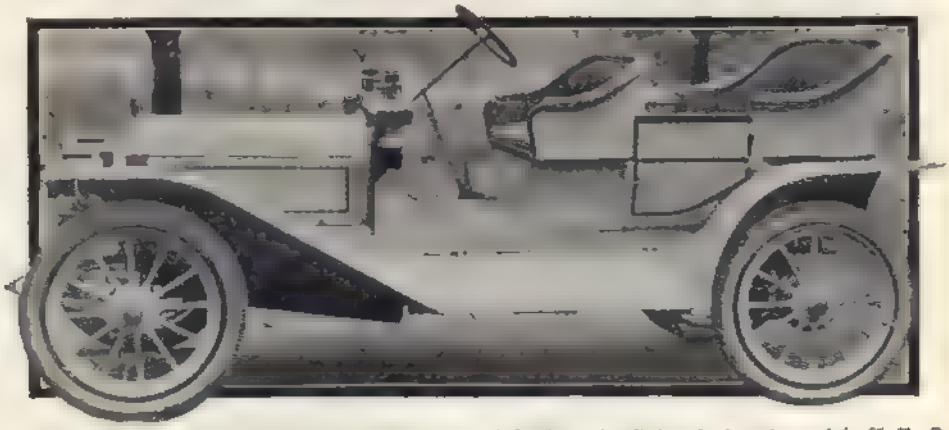


Fig. 1. Crawford 1909 Model H Light Touring Car and Roadster. 4 cylinder, 4 x 4, water cooled, 25 H. P. motor, double ignition, cone clutch, selective type sliding gear transmission, rear axle and universal shaft propeller shaft housing acting as torque rod. Transmission and full floating type rear axle mounted on ball bearings. Tires 32 x 3½. Double brakes on rear hubs. Price as a passenger touring car $1,300, as a runabout with single assemble seat, $1250; wheel-base 104 inches, tread 56 inches, weight 1,700 lbs.

### THE NEW MODEL H

This car is an entirely new design for this season, and has been laid out to meet the requirements of the large number of car purchasers who wish a high grade machine of standard design, sufficient horsepower, light weight with accompanying low upkeep, and yet at a moderate price. The 4-cylinder, water-cooled, 1909 Rutenber motor has been adopted, the performance of which is well known to be entirely satisfactory. The cylinders are 4 x 4, rated as 25 H. P. The motor cylinders are cast separately, but with flattened water jackets on cylinder adjacent sides and valves in integral chambers on one side making a very compact engine.

The special lubricating system consists of an oil reservoir at the bottom of the engine crank case, a gear pump at the lower forward end of the engine case and leads to the top of the main bearings. The oil pump is driven by a vertical shaft, which derives its motion from bevel gears from the engine shaft, and the oil is taken from the sump and forced through copper tubes to the upper side of each of the main bearings, where it is received in shallow oil pockets. Felt filled leads from these pockets convey the oil to the surface of the bearing. These leads being filled with felt prevent any grit from reaching the bearing surface. A constant level for splash is maintained in the case by means of suitable overflows, the oil passing through strainers into the oil well at the bottom, in which at the forward end a glass sight gauge is installed.

Connecting rod big end and main bearings are made accessible by a large hand hole plate on each side of the case. The engine is supported on an angle steel sub-frame by four integral aluminum crank case arms. This sub-frame, which is 2 x 1½ in. section, is carried back and supports the transverse brake rod and concentric tube arms, from the ends of which arms connect directly with rods operating the brakes. None of these rods extend outside of the chassis frame. The inlet and exhaust manifolds are each held by yokes and nuts, and can be quickly removed.

A 15¾-in. diameter leather-faced cone clutch is arranged in the fly-wheel, and is controlled by the left foot lever. This clutch, as usual, is forced into engagement by a coiled spring, and its translatory motion is allowed for by milling into the rear of its hub four large radial slots into which the ends of the first member of a universal joint are sliding fits. This allows the clutch hub to be moved forward or back, but still it must transmit

its radiation to the universal joint at its rear end. The rear member of this universal joint is a yoke keyed to the forward end of the propeller shaft, which shaft has a bearing in the Y-shaped bronze casting, the ends of which casting are trunnion supported in fixtures on the subframe. This Y-shaped piece also has attached to it the forward ends of the propeller shaft housing, only one universal joint being used, and the housing acting as a torsion arm. This construction is clearly shown in the plan view of the chassis. At the rear the propeller tube fits into the forward end of a cast malleable iron rear axle change speed gear case, which is integral with the rear differential and axle housing, the whole forming a very compact rear axle construction. The change speed gear provides three speeds forward and a reverse, and is selectively operated by a special Crawford mechanism, which will be described under the gear shifting mechanism. This change speed has the two shafts arranged over each other, with the counter shaft at the bottom. There are two shifting gears. By moving one forward the high speed is obtained by means of a six-lugged clutch, giving a positive lock, a slight backward motion of this gear gives intermediate, and the other sliding gear gives the low speed and reverse. The gears are 6-8 pitch—that is, the width of the tooth is what it should be for six pitch, and the depth of the tooth is made to correspond to that of an 8-pitch gear, giving less depth; or, in other words, a stockier tooth, which is very strong. Special Carpenter nickel steel, case hardened, then heated and oil dipped; then again heated to a predetermined temperature in an oil bath, is the method employed in finishing these gears. The last heating gives all the gears a uniform hardness. This method has been employed for change gear finishing during the previous season, and has given entire satisfaction. Both shafts are mounted on adjustable ball bearings. The forward end of the counter shaft rests in a ball bearing, the cone of which is castellated, so that when screwed up to the proper position it can be locked. This also draws the rear bearing up to position. The front end of the gear case is applied by seven cap screws. Into this piece the rear end of the propeller shaft housing is forced and held by four cap screws threaded through the case and into the tube. Two of these cap screws also hold the ends of diagonal brace rods, which run to the outer ends of the rear axle tube and are securely fastened to the brake rod supports. The driving bevel pinion is supported directly on ⅝-in. balls and at the forward end a double circle of ⅝-in. balls is used, while ½-in. balls are used on the counter-shaft bearings. The differential, which is of the bevel pinion type, is mounted on ⅝ in. ball bearings, the ball cups being pressed into the malleable iron case.

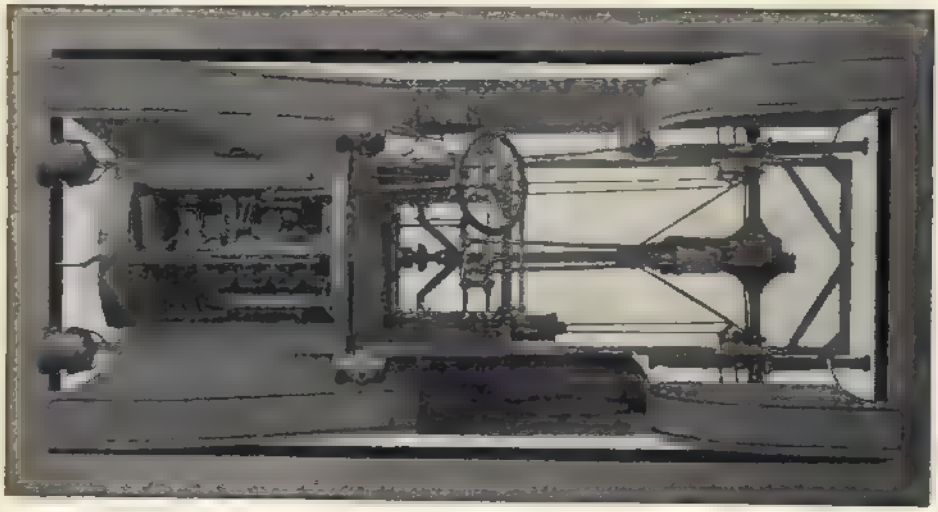


Fig 2. Plan of the chassis of the new Model H Crawford. This view shows the compact 4-cylinder motor, location of magneto, the new selective gear shifting mechanism, as described in the text, and the sliding gear three speed and reverse transmission, rear axle. Also the Y shaped piece with trunnioned ends which support the forward end of the propeller shaft housing, which is the torsion arm and takes the driving effort of the wheels.

### BALL BEARING FLOATING AXLE

The rear axle is of the floating type, the inner ends of the live shafts being Woodruf, keyed to the bevel gears of the differential, while the outer ends drive the wheel hubs by means of four lugs on a ring which fits over the square end of the shaft. The wheels are mounted on ball bearings, which run on the outside of the axle housing, so that the shafts carry no weight of the car, but simply transmit rotation to the wheels. The axle tubes are pressed, riveted and keyed into the malleable differential housing. The front wheels are also on ball bearings.

Wheels are 32 inches wide with 3½-in. tires. The front axle is of tubular pattern, but is reinforced on the inside by a ½-in. vertical web, which is placed in the tube while straight and bent with it to the axle form. The front springs are semi-elliptical, 42 in. long, 1¾ in. wide, and have six leaves, banded at points about two-thirds the distance from the centre, and are perched on top of the axle on spring seats, which are brazed in place. The rear full elliptic springs are perched on the under side of the rear axle tube, the spring seats being swivel mounted.

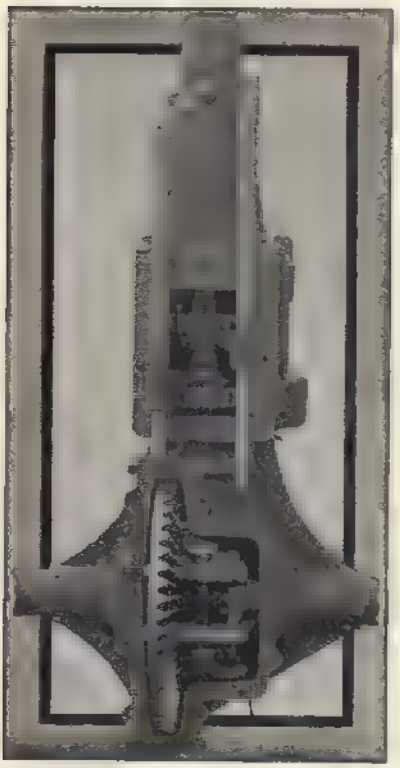


Fig. 3. Closer view of the very compact Crawford transmission rear axle unit. The gear shifting rods controlling the speeds are clearly shown and also the bevel gear differential and large driving bevel, the top of the transmission case being removed. This entire mechanism runs on ball bearings. Details described in the text.

The steering gear is of the bevel gear and pinioned type, has practically no back lash, and it is said by the makers, has given perfect satisfaction in the hands of users. The cross link is at the rear of the front axle and is raised above the axle, so that it is protected. There is nothing whatever below the axle to be struck by road obstructions.

The frame is the usual pressed steel construction, ⅛ x 1½ x 3½ in. depth with straight sills. The cross members are both angle steel and pressed steel. The front cross member is angle steel bent to fit the bottom of the vertical flanged tube rotator, forming a hammock support. The rear cross member is pressed steel with gusset plates and reinforced by diagonal angle steel braces. The middle cross member is of angle steel and supports the rear end of the sub-frame.

A float feed carburetor arranged for automatic compensation is used, gasoline fed to it by gravity from a 10-gallon heavy tin tank placed under the front seats. Heavy block tin is used in preference to copper and has been found to give better satisfaction. A double system of ignition is used with magneto and distributor, dry cells being used for starting. A single set of plugs, and a non-vibrating single coil are employed, making a simple ignition system.

### CONTROL

The usual spark and throttle lever control are supplied on the hand wheel, the left pedal controls the clutch, and the right operates the outside contracting service brake, the drum of which is 16 in. in diameter. The outside hand lever controls the inside expanding camel's hair belt lined brake. The brake pull rods are entirely inside of the chassis frame and connect with short shafts parallel to the rear axle and mounted on it, which by means of toggle joints or cams, operate the brake bands. The brakes are fitted with a dust-tight shield, the external brake being used as the service, and the inside as the emergency brake, as the latter is protected, and should be in shape for quick action. The body is of wood, with the exception of the seat forms, which are of metal. Tufted upholstery is used on the touring model and plain on the runabout. All bodies are ironed for tops.

### THE GEAR SHIFTING MECHANISM

An entirely new and original method of selective gear shifting is used on this new car. This mechanism is shown in the plan view of the chassis. There are two sliding gear members in the rear axle transmission, each controlled by a rod sliding through the top of the case in a longitudinal position, the correct position for each speed being retained by spring pressed balls engaging sockets in rods. The forward ends of these rods are connected to a cross shaft under the footboards. The outside hand lever can be moved transversely, and also forward or backward. When moved toward the driver it slides a shifting gear sector into such a position that it meshes with another gear sector on the shaft previously mentioned to which the control rods are connected. With the lever in this position a reverse motion gives the reverse speed, while a forward motion gives the low

speed ahead. If now the gear shifting lever is moved outward, its sliding gear sector meshes with another gear sector to control the rod operating the intermediate and high speed; the backward motion of the lever giving the intermediate, and the forward motion giving the direct drive on the high speed. A U-shaped bolt is so arranged and controlled by the motion of the sliding gear sector that when one speed is in the others are locked and cannot be moved.

## A $370 MAIL ORDER MOTOR BUGGY

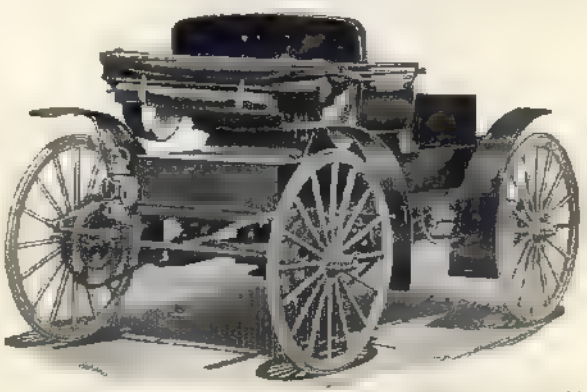
Sears, Roebuck & Co., of Chicago, Ill., one of the largest mail order houses in the country, have lately taken up the sale of automobiles and are offering a 10-12 H. P. motor buggy at $370, or $395 with top and fenders. The price in each case includes 3 lamps. From the cuts herewith it will be noted that the machine is a neat, trim looking rig and materials and constructive features are claimed to be thoroughly reliable and satisfactory. Sears, Roebuck & Co. claim to manufacture these machines and as they sell direct to users all intermediate handlers' commissions are eliminated and selling price is kept at a minimum. These cars are sold by mail, cash must accompany order, and customer pays the freight. The shipping weight including crate, etc., is 1,200 lbs

Three-quarter front view of the Sears Motor Buggy with top up. Price $395 with top and fenders; $370 without Prices include lamps

The motor is a 2-cylinder, opposed, air-cooled gasoline engine of 4 1-16 inch bore and 4-inch stroke. The crank shaft is a nickel steel forging of 1⅝-inch diameter. A friction transmission is used and drive is by side chains from the ends of the countershaft, Diamond chains being used. An internal, expanding brake acts on each rear wheel and may be locked in position when the car is left unattended. The wheels are 36 inches in diameter and are shod with 1¾-inch Diamond solid tires held in electrically welded channel rims. Timken roller bearing axles are used, 1⅛ inches square, drop forged steering knuckles being used in front. The frame is of angle steel 2x1½x3-16-inch. It is carried on 4 full elliptic springs 36 inches long.

The body is securely bolted to the angle steel frame but can be easily removed without disturbing any of the power plant parts. It is of the piano box type and measures 30 inches wide by 67 inches long. The rear portion is covered by a wood deck boot under which and under the seat there is a space 29x21 inches for carrying luggage. The fuel tank, ignition battery and spark coil are fastened to the body under the seat. The seat is 37 inches wide and is well upholstered all over including the ends in heavy "Morrocoline" imitation leather. The seat cushion is removable.

The top is a 3-bow skeleton job made of a heavy grade morocco line with side and back curtains When up it is held by two straps running from the front bow to the dash The weight of the machine is 1,000 lbs. The road clearance is 13 inches; wheel base 72 inches; gauge 56 inches. The gasoline tank holds six gallons, enough for 150 miles' running.



Three-quarter rear view of the Sears Motor Buggy with top down

Three lines of Great Western cars are being manufactured by the Model Automobile Company of Peru, Indiana, for the season of 1909. These Models are styled Model 20, 21 and 22. Model 20 is rated at 30 horse power. Model 21 at 40 horse power and 22 at 50 horse power. Each model is an exact reproduction of the 50 horse power 7-passenger car this company has been building for the last three years, the only difference being size and horse power.

The mechanical construction being alike in all, with the exception of size, but one description is required. Semi-elliptic springs are used on the 7-passenger car and full elliptic on the rear and semi-elliptic in front of No. 20 and No. 21. These several models are made in either Touring car or Runabout styles with double and single interchangeable rumble seat. No. 20 and 21 can be had in the convertible type from tourer to runabout at the same price.

This company builds a 500 horse power 4-cylinder stationary engine, which is exactly like the 30 horse power automobile engine or motor. Fifteen years have been spent in building this style of motor, and automobiles have been built by them for the last six years. The largest 4-cylinder motor is 17 inch bore and 30 inch stroke, always along the same line of construction. No radical changes have ever been made during this time, simply refinements.

The 7-passenger 50 horse power car's weight per horse power is only 58 2-5 lbs., the 30 horse power and 40 horse power 62½ lbs.

The 4-cylinder motors have remained practically unchanged from last season and were described in the Journal, May, 1908, page 80.

The cylinder dimensions are No. 20, 4 inch bore, 5 inch stroke. No. 21, 4½ inch bore, 5½ inch stroke. No. 22, 5 inch bore, 5½ inch stroke. The cylinders are cast separately and machined inside to obtain uniform compression, are reamed and ground to size, water jackets are large and spacious being larger at the top where the heat is most intense, giving great cooling effect. The pistons are roughed inside and out and then annealed before they are ground, this giving them an equal expansion when finally fitted and permitting a much closer fit than can be obtained otherwise without sticking when hot. After being fitted with this process it is claimed to be possible to remove all piston rings without making any perceptible change in the running of the motor.

The exhaust valve is located in the head and is completely surrounded by water. This arrangement preserves compression as there is less tendency for valve seats to pit or warp. The intake valve is at the side and as close to the cylinder as possible for the purpose of leaving practically the entire clearance in the cylinder. The exhaust has ⅛ inch stem, the top of which is cupped out to receive a steel ball against which the rocker arm works. This is done for the purpose of eliminating noise and to guard side-wearing of the valve stem and practically overcoming any wear endwise. The adjustable valve lifters for the intake valve are also equipped with ball ends for the same purpose as the exhaust.

The cylinders are offset from center of crank shaft ⅛ inch.

The crank case is aluminum in two pieces with spacious hand-holes for connecting rod inspection and adjustment, and has five bearings for the crank shaft. The crank case proper does not take any of the strain of the power strokes of the

Fig. 1—Model 20 Great Western, 20 H. P. car, fitted with double high backed rumble seats. This car is furnished also with touring body and can be converted from one to the other.

piston, instead the studs which hold the cylinders to the crank case go clear through and hold the Manganese Bronze bearing caps of the crank shaft, thereby bearing the whole load or strain where it belongs and not on the aluminum threads as in most other motors. The bottom half can be quickly removed without interfering with any bearing.

Nickel babbitt die cast bearings are used on all main and connecting rod bearings. The five main bearings are exceptionally long with the bearings fitted into Manganese bearing caps.

The crank shaft is a solid one-piece drop forging, heat treated and ground to size, carefully balanced alone and with flywheel assembled.

All valves are operated by a single cam shaft. The gears for cam shaft, pump and magneto drive are enclosed in a separate oil pipe case, which is divided in such a way that either the pump or magneto can be removed, independent of each other or the balance of the gears. In fact by removing this case cover and loosening two nuts the whole cam shaft may be removed from the front for repairs and inspection without interference with any of the other parts of the motor.

Spiral gears are used on the crank shaft and cam shaft eliminating noise.

A gear pump is used with flat tube radiator of ample size to insure proper cooling under the most trying conditions of service, and a fan is mounted on an adjustable bracket and is driven by a 1 inch belt at 3½ times the engine speed.

Ignition is by high tension magneto and battery, each system being independent of the other. The magneto is located on the right forward supporting arm of the crank case just ahead of the carburetor.

The gasoline passes by gravity to a Schebler Type-F automatic water-jacketted carburetor located at the center of the

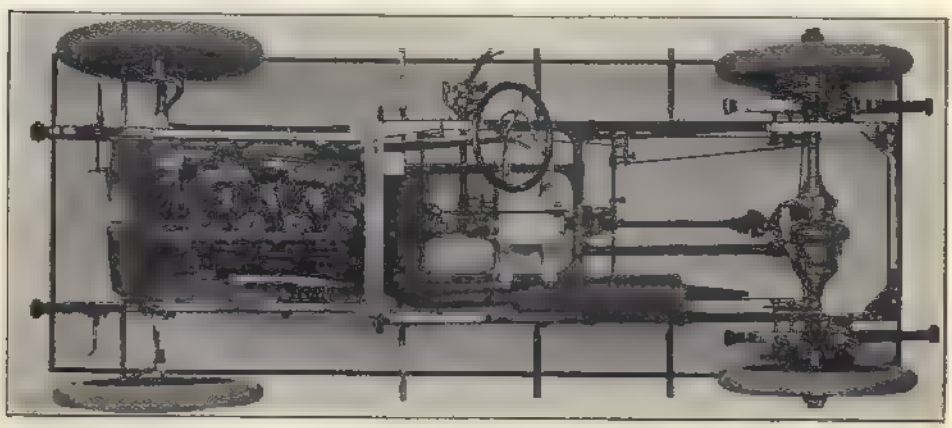


Fig. 2—Plan view of the chassis of Great Western Model No. 21 40 H. P. four-cylinder motor, 4½ bore by 5½ stroke. Wheel base 114 inches, semi-elliptic, front springs 2 x 40 inches full elliptic 1¾ inches by 40, selective sliding change speed gear, magneto ignition. Note the exhaust valve arranged in the head, and double universal and slip joint between the engine and change speed gear.

motor on the right hand side just below the inlet valve chambers.

The exhaust is on the left side of the motor and shows careful designing. The manifold gradually increases in size as each lead enters until at the outlet it is double the first size. All bends in the exhaust pipe are long curves, avoiding any sharp bends anywhere in the exhaust line from the engine to the outlet of the muffler. The latter is a well known tube type and of large proportion, permitting full expansion of the gases and is very quiet.

The oiler with 7 sight feeds is mounted close to the exhaust pipe to keep the oil flowing freely in cold weather and is driven by an eccentric and ratchet, eliminating the troubles of belt driven oilers The splash system is used in the crank case.

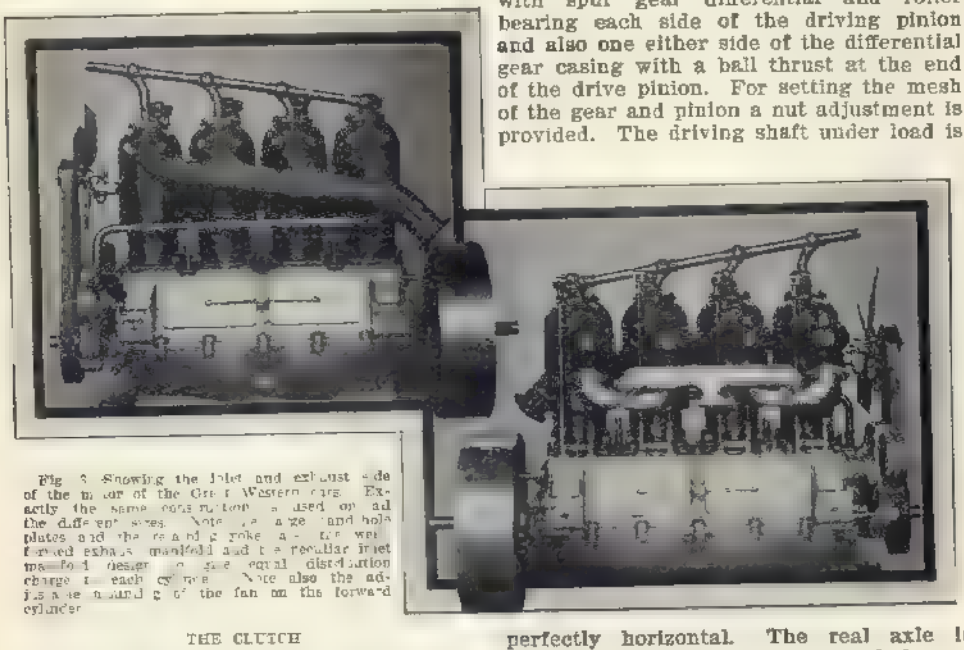


Fig. 3. Showing the inlet and exhaust side of the motor of the Great Western cars. Exactly the same construction is used on all the different sizes. Note the axle and hole plates and the reaming yoke and the well formed exhaust manifold and the peculiar inlet manifold design to give equal distribution charge to each cylinder. Note also the adjustable mounting of the fan on this forward cylinder

THE CLUTCH

A cone clutch is used with a composition covering with springs under the covering to insure easy engaging. One of the features of the clutch is its manner of releasing, which is through a ball thrust bearing instead of a sliding yoke. This ball thrust collar is of split type making it easy to remove, the thrust plates being hardened and ground. This type of clutch is simple, easily understood and quickly adjusted for wear. The connection between clutch and transmission is a double universal joint with sliding square for clutch release. In fact it is much the same as from the transmission to the rear axle.

Much stress is placed by the makers on the use of this construction as they claim for it all the advantages which are said to be secured in alignment by the use of the unit power plant without any of the disadvantages of inaccessibility attendant upon the use of the housed in unit construction.

The change speed gear is of the selective type sliding gear, three speeds forward and reverse using Timken Roller bearings and nickel steel gears, oil treated. The counter shaft gears are keyed and forced on by hydraulic pressure, spaced by tubing separators, the reverse gear is forged integral with its shaft and the gear on the opposite end is riveted in place. The drive shaft is round with four keys milled into it, hardened and lapped to size and bearing, making them absolutely interchangeable. Both shafts, counter and driver are on Timken Roller bearings and are adjustable for wear and the drive has end thrust ball bearings. The final drive to the rear axle is by bevel gear and shaft to a floating type rear axle with spur gear differential and roller bearing each side of the driving pinion and also one either side of the differential gear casing with a ball thrust at the end of the drive pinion. For setting the mesh of the gear and pinion a nut adjustment is provided. The driving shaft under load is perfectly horizontal. The real axle is heavy steel tubing, riveted and brazed and the brake hangers and dust flanges are cast steel. Two large and powerful brakes, internal expanding and external band are provided on the rear wheel hub drums. The external band is lined with camel hair fabric. These brakes hold both ways positively the internal being operated by a hand lever, external by foot-lever. A 1⅝ inch nickel steel floating axle transmits power to the hub clutch plates in each rear wheel. The front axle is the I-beam type of solid one piece forging, the center of it being the lowest point of the car.

The pivot point of steering knuckle is supported on hardened thrust bearings.

STEERING GEAR

The steering gear is of the worm and gear type, the gear being a complete wheel forged integral with its shaft, in-

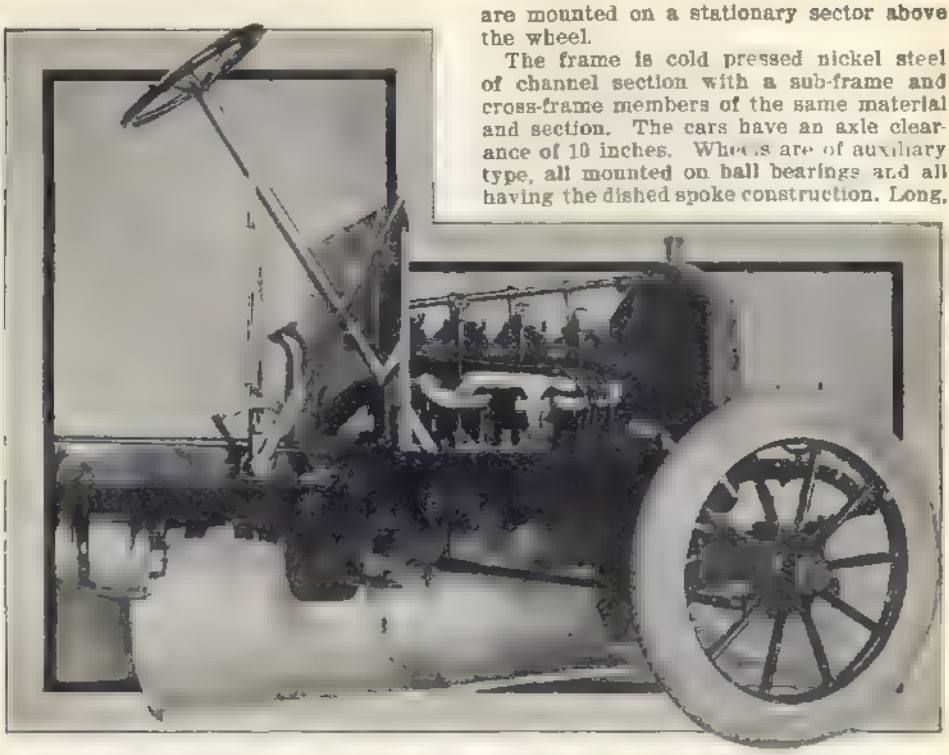


Fig. 1—Great Western car, model [illegible], with 40 H. P. four-cylinder motor 4½ bore, [illegible] the frame and the [illegible] mounting the [illegible] the practically clear [illegible]

are mounted on a stationary sector above the wheel.

The frame is cold pressed nickel steel of channel section with a sub-frame and cross-frame members of the same material and section. The cars have an axle clearance of 10 inches. Wheels are of auxiliary type, all mounted on ball bearings and all having the dished spoke construction. Long, flat easy-riding springs are fitted to all the models, those on the front of No. 20, being 2x38 inches and the rear are 1¼x38 inches. On No. 22 the rear are 1¾x40 inches and 2x40 inches at the front. The rear springs of both these models are full elliptic. All springs of No. 22 are semi-elliptic, those at the front being 2x40 and at the rear 2x56 inches, which is an ex-

suring great strength and providing a greater amount of wearing surface. A dust-proof, cast steel case surrounds it and eccentric bushings are provided for adjustment to take up wear. All parts are drop forged. The steering post has considerable rake and is surmounted by a Circassian walnut wood-rimmed wheel. The usual spark and throttle hand levers

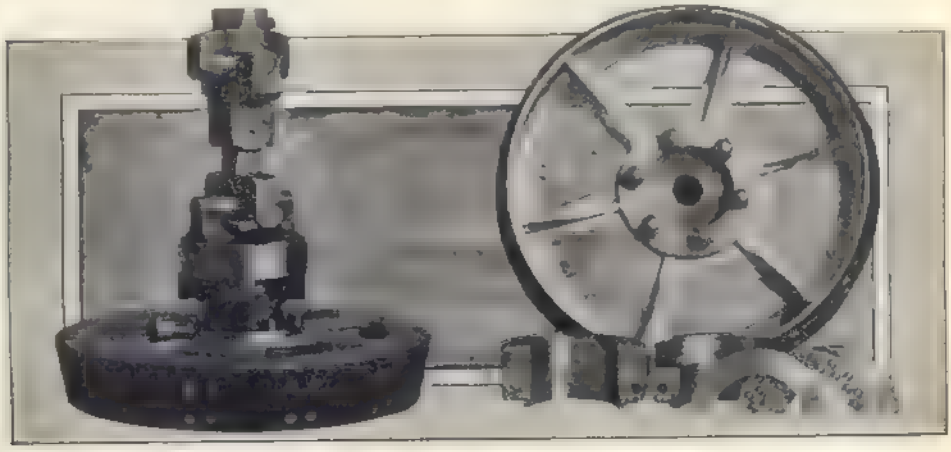


Fig. 2—Views of the Great Western car's composition covered aluminum cone clutch. Also the double sliding universal joint, and at the right the ball thrust yoke used for engaging clutch instead of the usual form of yoke ordinarily employed.

ceptionally long spring. The fenders are of metal, ample weight and graceful design. A metal pan, hinged at one side encases and protects the under part of the car. This can be quickly removed, giving access to the entire under side.

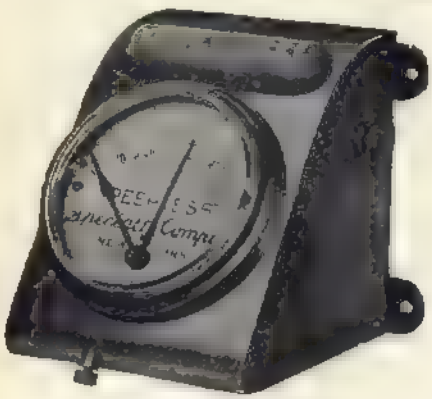
The change speed gears are controlled by a lever at the right, the high speed being obtained by moving the lever toward the driver. The other lever, as usual, controls the emergency brake. One pedal controls the remaining brake, and the other the clutch.

Considerable attention has been given to making the position of the driver comfortable. For this purpose considerable space has been allowed between the front seat and the dash. The tonneaus are also long and roomy. The upholstering and paint are automobile red, with hand buffed leather trimmings. The runabouts, however, are finished in French gray and upholstered in black. The wheel bases of the cars are as follows: No. 20, 106 inches; No. 21, 114 inches; No, 22, 122 inches, with treads 56 inches. No. 20 has 32x3½ inch tires; No. 21, 4x34 inch tires, and on the large car the front wheels are 36 inches with 4 inch tires, and 4½ inch tires are used on the rear. All cars are equipped with two gas lamps, one generator, two oil lamps, a tail lamp and tool kit, which includes jack, pump and tire repair kit.

## THE "PEERLESS" SPEEDOMETER

This instrument is the product of the Peerless Specialty Co., of 1876 Broadway, N. Y. City, and one of its most conspicuous features is the fact that the odometer can be read from the tonneau seat.

The odometer wheels are pure white with neat black numerals and are driven from a steel worm or drive shaft connecting with a worm gear and a shaft to a 10 tooth, 48 pitch gear connecting with a 40 and 10 tooth combination gear to a 50 tooth gear which drives the season



The "Peerless" Speedometer

odometer shaft which registers 9,999 9-10 miles, then repeats. The trip odometer is run from the 40 and 10 tooth combination gear connected to shaft running through instrument to another 50 tooth gear. The odometer numerals are operated with six tooth geneva gears, every other tooth being milled to width of odometer wheel. This arrangement is absolute and will not allow odometer to skip or jump miles.

The season and trip odometers work independently of each other when resetting trip.

The governor is made of brass and so arranged as to be calibrated from five different points insuring absolute accuracy from 1 to 60 miles. Spring tension is used, but as the governor has only 3-16 inch travel, that there is practically no wear, or possibility of getting out of order.

The governor slide is made of brass, working up and down on a burnished steel shaft driven from a 48 pitch 35 tooth bronze bevel gear connecting with a 20 tooth steel gear; the shaft runs on point and cone bearings, hardened, ground and lapped. The slide is slotted to receive a steel ball that actuates the speed indicating hand. The steel ball is hardened and burnished and attached to a 110 tooth, 110 pitch gear that meshes with a 110 pitch, 35 tooth gear fastened to the staff of the speed hand.

The extreme movement of the slide is 3-16 inch.

The drive shaft is made of tool steel and runs in ball bearings, insuring long life of the flexible shaft. The drive shaft is made from 16 strands of the best piano wire wound in four layers and runs in a flexible brass casing, steel lined. The casing is filled with cosmoline and graphite to lubricate and insure shaft from crystallization.

The maximum hand is operated by a pin from the speed hand and held in place by a 300 tooth ratchet gear and spring which locks it until a button at the bottom edge of the instrument is pressed which releases lock and is returned by watch spring connected with hand staff.

Pinion and sprockets are cut out of steel ¼-inch thick, and hardened to proper temperature.

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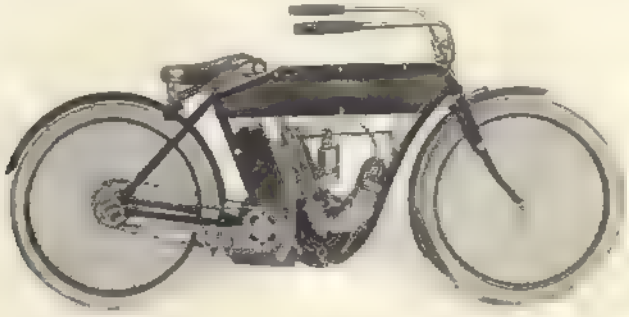
The announcement of the White Company that its 1909 models will use California distillate as fuel, which costs 6 cents per gallon, as against 25 cents for gasoline has caused some comment. In addition to the economy in the cost per gallon, it is claimed that distillate will run 20 per cent, farther on a gallon than will gasoline, thus reducing the cost of automobile operation for fuel to about one-fourth the previous cost.

## HENDEE MFG. CO. PREPARED TO GIVE PUBLIC WHAT IT WANTS

Recognizing the sway of fashion and determined to meet every demand of the public, Hendee Mfg. Co., of Springfield, Mass., have prepared for 1909 a line of "Indian" motor cycles including both belt and chain-driven models with both diamond and loop frames. They do not recede an inch from their beliefs as to what is best from an engineering standpoint and they will recommend the use of chain drive and diamond frame. The line includes a 2¾ and a 5 horse-power model each with chain drive and diamond frames only, and 2¾, 3½, 4, 5 and 7 horse-power loop from models to be furnished with either chain or belt drive, excepting the 2¾ H. P. model which for the present will be furnished with chain drive only. The 2¾ diamond frame, chain drive model is listed at $175, the 5 H. P., chain drive model at $225. The list prices of the loop frame models are respectively $200, $225, $275, $275 and $325, the last three being furnished only with magneto ignition while the 2¾ and 3½ horse-power models may be had with either battery or magneto ignition, the latter of course at additional cost.



The new single cylinder loop frame Indian. Furnished with battery or Magneto ignition.

The new loop frame model is expected to meet with popular approval. Besides a most symmetrical and pleasing outline, this model gives the low rear seat position, so much in favor at present, with the low, forward engine position. This frame is constructed of reinforced tubing, the reinforcement consisting of a continuous mid rib of steel plate rolled into the tube during its manufacture; and in forming the frame this reinforcing plate is kept in line with its longitudinal plane, stiffening and strengthening it in the direction of the severest shocks and strains. The frame is also built with double top tubes, which not only greatly increases its strength but produces an absolutely rigid head, features greatly to be desired on account of the excessive speed at which riders are now driving their machines.

An important feature of the new model is the increased tank capacity, for both oil and gasolene. The gasolene tank contains a little over two gallons, and is conveniently located between the two upper tubes of the frame. Built into it is a most substantial cut-off valve, this company's experience having satisfied them that a perfectly satisfactory outside valve cannot be constructed. The oil tank is also new, and contains about two quarts. It is located on the rear bracket that secures the motor to the frame, in about the same position as in previous Indian models, but of greater capacity and securely fastened to the bracket and to the seat post.

An oil reservoir has also been introduced into the motor base. It will hold a sufficient quantity of oil to insure a thoroughly efficient splash system for the lubrication of the inner mechanism of the motor. As an adjunct to this reservoir a little window, covered with a heavy glass is formed in the side of the motor base, enabling the operator at all times to directly inspect the condition of his lubrication.

In the motor itself there will be no radical changes, but it retains all of the peculiar and special features which have made it notable in the past. In details, however, there are many variations from previous construction. In all of the new models the spark plug will be placed in the middle of the head, and in the twins the valve mechanism has been wholly remodeled, making it simpler, stronger and more efficient, while at the same time it is practically impossible to get out of adjustment. The valve lifting device is also entirely new, direct acting and certain in operation. In the single-cylinder machines the valve mechanism remains the same as heretofore, the present form having proved most satisfactory.

The Indians will, as heretofore, be supplied in royal blue and Indian red, with the additional choice of Indian green, the french gray having been abandoned as undesirable.

The new loop frame design has been very thoroughly tried out during the past season in a number of racing machines that have been put into all of the most strenuous events of the year.

The new frame is a trifle longer than in previous models, making the wheel base 53 inches long, the extra length making

for steadiness in running, besides adding considerably to the ease and gracefulness of the lines of the design. This added length, together with the rear saddle position, necessitates longer handle bars.

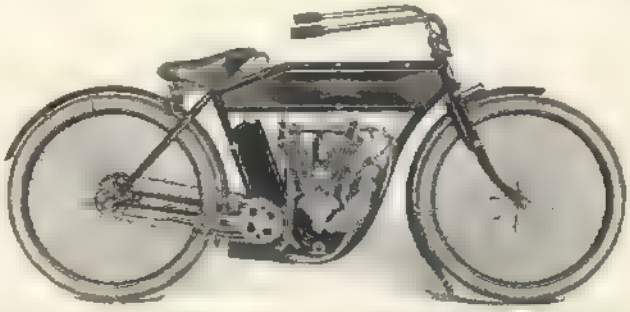
A most valuable feature of the 1909 Indian will be a new and powerful band coaster brake, built especially for this machine. This is an exclusive Indian feature. The idea of combining the accepted value of the band brake with the indispensable coaster feature is novel.

The most noticeable feature of the 1909 Hedstrom motor, which is used on the Indian machine, is the new mechanical valve action in which simplicity is a leading characteristic. Two cams are used in the twin, as usual, but one cam operates the inlet valves exclusively, while the other cam operates both of the exhaust valves. This arrangement has the advantage that simpler cams can be used, resulting in more regular and even action, and their operation is also practically inaudible at the highest speeds. The cams are also wider than ever before, which lessens the liability of wear, and contributes to smooth action. The exhaust cam operates on one arm of a bell crank lever, which carries a hardened steel roller, taking up all wear on the cam; and this bell crank operates a lifting finger, interposed between it and the valve lift rod. If there is any wear in the mechanism it must come on the lever or finger, which are quickly replaced at a trifling cost. The exhaust valve lift rods are provided with hardened steel adjusting screws, which entirely obviate all of the old difficulties of securing proper adjustment at this point.

The inlet valves are operated from their special cam through a light lift rod and a little rocking lever pivoted on the dome. The action is said to be positive, regular, smooth and quiet.

The new exhaust valve lifting mechanism is equally efficient. A steel disc having cams formed on its two opposite edges, and a toothed sector on its upper edge, is pivoted by a hardened steel bushing on the projecting end of the bronze cam shaft bearing. A short shaft passing through the cam case, and having a bearing in both the cover and body of the case, carries a crank lever at its outer end and a pinion at its inner end. This pinion meshes with the toothed sector on the valve lifting disc, and the lever connects with the usual valve release rod from the grip control. On operating this lever the pinion revolves the disc, causing the cams on its opposite edges to act on the bell crank levers, before mentioned, thus lifting the exhaust valves by a direct, positive and certain action which is both powerful and smooth in operation. The inlet is placed over the exhaust and in the same pocket so that the cold vapor entering the chamber tends to keep the exhaust valve cool.

One point in particular in the design of the mechanism contained in the cam case is worthy of special consideration, and that is every shaft, pin or stud, carrying the operating mechanism, has a bearing at both ends, one in the case itself and the other in the substantial cover, an arrangement that entirely overcomes the possibility of any part twisting or working loose. In all of the new models the valves have been increased in size, this improvement being suggested by the successful experience with the 3½, 4 and 7 H. P. models of 1908, which latter sizes retain the same sizes of valves for 1909. All of the valve gears in the 1909 models are wider than heretofore, greatly increasing their strength and wearing qualities. The bearings have also been increased in size.



The New Indian Loop Frame 2 cylinder motor cycle. Furnished with Magneto Ignition only and with chain or belt drive.

The enlargement of the valves, with the accompanying increase in size of both inlet and exhaust pipes, has materially affected the operation of the motor, giving an increase in power, with a smoothness of operation never before attained. With the increase in size of the valves, corresponding changes have been made in the carbureter, but these in no way affect the principles, operation nor its efficiency. The location of the spark plug in the center of the cylinder head, a change made possible by the new location of the motor, will be approved of by many. A minor change, but contributing to the appearance of the motor, is the stripping of the cooling ribs from the lower third of the cylinders, which is believed will meet with popular approval.

A very notable change has been made in the design of the motor base used in the 1909 machines which greatly improves the lubrication of the motor. In the lowest part of the base an oil pocket is formed, which contains an ample surplus of oil, and into these reservoirs the fly wheels dip sufficiently to continually pick up a fresh supply of oil, which is thrown forcibly upon every moving part by the rapid revolution of the fly wheel. With the very considerable quantity of oil which this reservoir accommodates not only is the lubrication more thorough than ever before, but the oil is maintained in better condition than was possible in the close fitting bases hitherto universally used. And to enable the rider at all times to ascertain the quantity and condition of his oil supply, instead of a gauge, that is liable to clog or leak, a window, protected by heavy glass, is placed in the base in such a position that direct observation may be made of the state of affairs in the reservoir.

The great feature of the 1909 machine is its accessibility. Every part, except the fly wheel group, can be reached directly without removing the motor from the frame, or doing any unnecessary dismantling; and if it is desired to remove the motor, this can be done readily. A dome can be removed at once; a cylinder-head, or the cylinder itself, is cleared in a few minutes. The exhaust pipes and magneto gears are clear of everything, and of each other, while the cam case can be dismembered in two minutes.

The attachment of the magneto is especially good, for it rests upon one of the brackets that connect the motor with the frame, thus becoming practically an integral part of the motor, and this is desirable in order to secure the smoothest operation of the train of driving gears. The location also renders every part of the magneto readily accessible, without the necessity of removing the magneto bodily for inspection or adjustment.

The oil tank occupies a similar position to the magneto, but at the rear of the cylinders, where there is sufficient room to securely locate a receptacle that contains fully two quarts, a supply sufficient for at least 400 miles.

Another feature of the tank is a new filling cap which will not shake off even if it does become unscrewed by the vibration of the machine.

The muffler for the new model has been entirely redesigned. The exhaust pipes are larger than heretofore, giving a very free relief to the spent gases, and in the twin both pipes are led directly, without any sharp turns, to the little muffler, and from there, after expansion and reduction of pressure, the gases pass off through a long vent pipe that extends far back and just below the rear fork side, discharging at a point where they can offer no inconvenience to the rider.

On the drive side of the machine a new chain and gear guard covers all moving parts, amply protecting them from mud and injury, and also protecting the rider from contact with these fast moving parts, and from flying oil.

In the belt-drive machine the counter shaft, with its compensating sprocket, is entirely omitted, and a V shaped pulley is substituted for the small sprocket on the engine shaft. A similar large pulley is built into the rear wheel, and on these the belt runs, giving a direct drive of the latest accepted type.

In the single-cylinder models the mechanical valves have the same operative mechanism as in the 1908 models, this having proved efficient and satisfactory in every respect. Otherwise these models are very similar in details to the twins, above described. The cylinder is inclined toward the rear, corresponding in angle with the seat post, in this respect resembling previous models.

In these models arranged for battery ignition the batteries are placed in a case that rests upon the forward bracket connecting the motor with the frame, in the same position that the magneto would be.

## NEW "EVER-READY" MOTORCYCLE SPEEDOMETER

Auto Improvement Co., 30 1-322 Hudson Street, New York City, are including in their line of 1909 "Ever-Ready" speedometers one called the "Milometer," for motorcycle use, which is here illustrated. This instrument lists at $15 with flexible shaft and handlebar attachments. Both the instrument and its fittings are nickel

The "Ever-Ready Milometer"

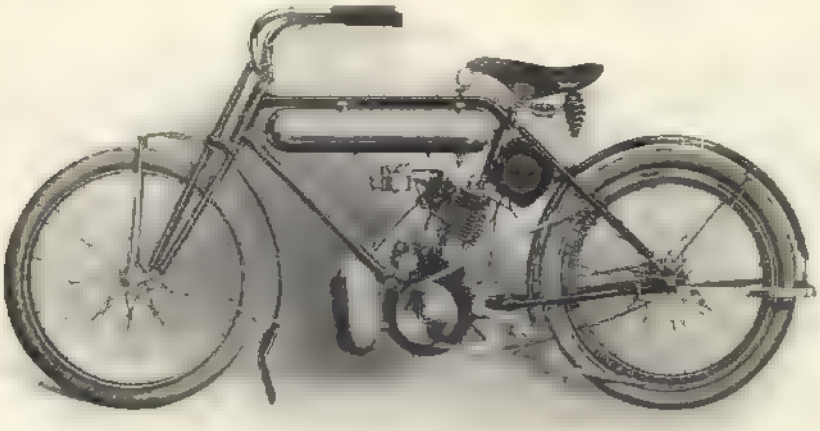
plated. The speed index registers up to 80 miles per hour and is suitable for machines of any power. This instrument contains the "Ever-Ready" direct drive odometer registering up to 10,000 miles and automatically re-setting to 0.

The Ever-Ready "Cycle-Meter," a 60-mile instrument, suitable for pedal or motorcycles lists at $12, or $15 with maximum hand. It registers up to 60 miles per hour. The dial is 2 in. in diameter. It is silvered and the figures are in black.

## "M. M." MOTORCYCLES FOR 1909

The American Motor Company of Brockton, Mass., makers of the well known M. M. motorcycles, is to market for the season of 1909 five distinct models.

This company's lowest priced model sells for $175 and is known as the M. M. 3 H. P. Roadster. It is finished in black. with nickel trimmings. This machine has the standard three batteries and coil form of ignition, and many 1909 improvements such as wide mud guards; a special constructed frame dropped at the seat post joint admitting of a more perfect saddle position; a 53-inch base; 26-inch wheels; equipped with 2¼-inch clincher tires;

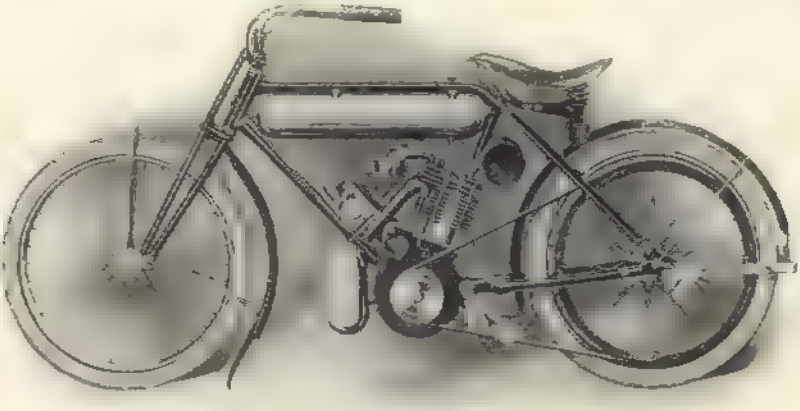


The "M. M." $2[illegible] 3½ H. P. Battery Special Model.

with 28 inch wheels, equipped with 2¼ inch Goodrich, Morgan & Wright, or G & J clincher tires; Messinger Cavalry seat; newly designed M. M. carburetor, giving the greatest possible range of speed on one adjustment, and also the M. M. silent muffler which so effectually muffles the engine, it is said, that the rider cannot hear the exhaust escape while riding. These, together with many other improvements mentioned more fully in the descriptions of the other models, are features of the 1909 construction.

The $200 M. M. 3½ H. P. Battery Special, shown herewith, is finished in red Messinger No. 3 Cavalry seat; the newly designed carburetor giving the best possible results under all conditions whether travelling five or fifty-five miles per hour; the M. M. silent muffler; a new engine construction which is so constructed as to admit of a perfect balance thereby delivering more real power and speed without vibration, a low center of gravity; wide flat, thick mineral tanned belt transmission, or "V" belt if desired.

It is also provided with the M. M. patent Motorcycle stand attached to rear of the frame and fastened to rear end of mud guard when not in use. Has ingenious



The "M. M." $225 3½ H. P. Magneto Special Model

device on fuel tank indirect contact with cupped pet cock in cylinder head for priming purposes during cold weather for easy starting, an improved double grip control.

The leader of the M. M. line is the 3½ H. P. Magneto Special, selling at $225 and illustrated herewith.

In addition to all of the improvements mentioned on the other models, this magneto Special is equipped with Bosch high tension magneto, thus doing away with all batteries and coil. It is also equipped with a special built tool box of metal, leather lined, of cylindrical shape, attached to frame in rear in same position as the battery box on the other models. This tool box is of sufficient capacity to carry a set of complete motorcycle tools. This model also has a greatly improved rear frame construction which admits of easily removing the cylinder head without taking machine to pieces. It also has a detachable rear mud guard to admit of easily repairing the rear tire. This model can be had with either a flat or "V" type of belt.

The "M. M." $250, 6 H. P. Twin Battery Model

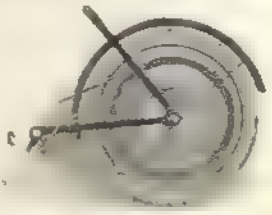
In the line of twin cylinder models this concern is offering the 6 H. P. Battery Twin, selling at $250 and the 7 H. P. Magneto Twin selling at $285. The 6 H P machine is fitted with four standard batteries and a double combination coil. This machine, in addition to all of the 1909 improvements, has a great many new features exclusively its own. Most particularly the 90 degree angle of its cylinders, which is claimed by the manufacturers to be the only possible angle for perfectly balancing a Twin Cylinder engine. The engine is said to cool much more freely at this angle because of more cooling service in and around the cylinders. It is said these 6 H. P. Twins can attain a speed of from five to sixty-five miles per hour. The transmission on this model is an extra heavy special made 3-ply, 1¾ inches wide endless Barnes mineral tanned belt or a "V" belt if desired.

The 7 H. P. magneto Twin, like the magneto Special, is equipped with Bosch high tension magneto eliminating all batteries and coil, and lists at $285. It has the same general construction as the $250 battery Twin, only has more horse-power and a special magneto, which requires a trifle different construction

## THE "K. & R." TWO-SPEED AND FREE ENGINE DEVICE

Keller & Risque, American National Bank Building, St. Paul, Minn., are manufacturers of the "K. & R." two-speed and free engine device for motorcycles, shown herewith.

The method of starting a motorcycle fitted with the "K. & R." device is unique. The foot levers are set on free engine position (always in this position when



The "K. & R." Conversion set complete as furnished for any make of motorcycle

machine is stopped), the exhaust valve raised to release compression, and the crank given one turn and the motor is started. The crank slips onto an automatic "back off catch" on the right hand side of the live back axle.

No foot pedals are necessary with this device but instead a foot or running board which is covered with rubber matting is provided. This board is on a slant so that the rider can change position of the feet while riding

Complete rear wheel of the "K. & R." Two Speed and Free Engine Device.

The foot levers for operating the "K. & R." are in convenient positions—one lever for high gear—one for low gear and one for the band brake; the free engine being obtained when neither high or low gear friction bands are in use. These friction bands also act as friction clutches, making it possible to start as smoothly and as steady as with an automobile, on

BY HUGH DOLNAR.

The 1909 line of commercial vehicles of the Knox Automobile Co., of Springfield, Mass., includes seven types of business wagons and trucks, and a variety of fire apparatus and other vehicles for municipal service. The Knox commercial chassis are of one, two and four cylinder types, the policy of the Knox Company being to furnish to each individual user the most economical and efficient type and size of machine for that particular user's work.

Knox heavy trucks have been in process of development for over two years. Both water and-air-cooled motors are used, the larger trucks having 40 H. P. air-cooled or 50 H. P. water-cooled motors. The lighter vehicles represent an even more extended experience and their performances are well known. They have one and two cylinder motors of 8 and 20 horse power.

Model 20, a single cylinder chassis is furnished with open or covered express body or panel delivery top, the price in each case being respectively $1,650, $1,700 and $1,800.

On the 2,500 and 3,000 lb. chassis a 20 H. P., 2-cylinder air-cooled motor, three point suspension power plant on sub-frame as illustrated. The motor can be detached from the chassis for overhauling and another motor installed in about an hour. This construction is a decided advantage where a number of cars are in operation for by having one or more spare power plants all the cars may be kept in commission practically all the time. A plane-

Fig. 1. Plan view of the Knox 2-cylinder, air-cooled chassis

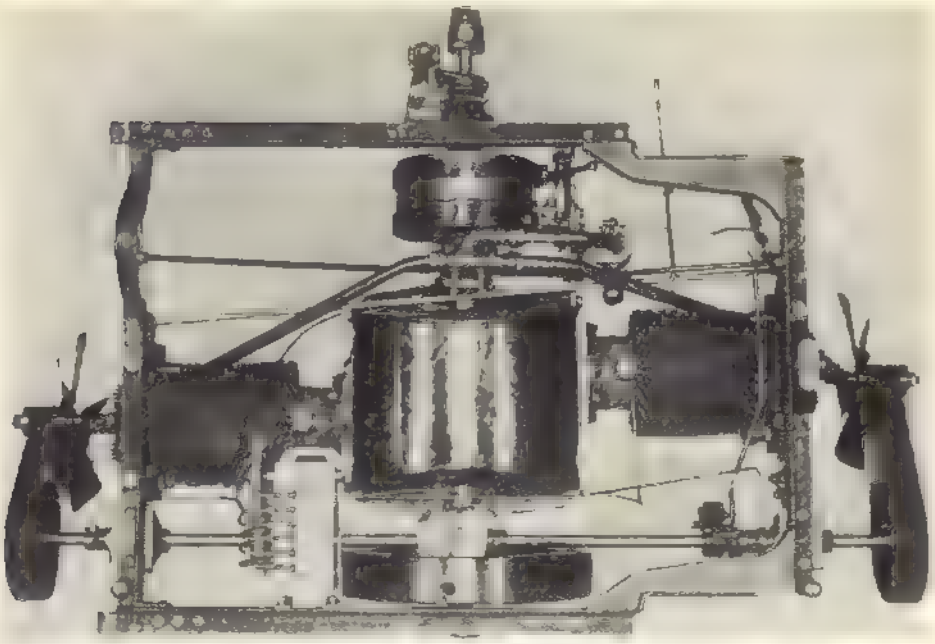


Fig. 2. Complete power plant of the Knox 4 cylinder commercial cars. The entire assemblage is placed on a sub frame and can easily be removed and replaced by a spare outfit if desired.

tary speed change gear is used on these chassis and can be detached without disturbing other parts. It gives the usual two speeds and reverse. A great variety of bodies are furnished on these chassis, meeting practically all requirements.

The following table taken from the Knox 1909 catalog concisely sets forth the sali

Fig. 3. Knox 1909 Model "G" Combination Hose and Chemical Truck. Capacity two 35-gallon chemical engines, 300 feet chemical hose, 1,000 feet water hose, 10 men. Wheel base, 125 inches. Gauge, 56½ inches. Tires solid 34 x 4 inches, front and rear. Engine cylinders, four air cooled, 4¾ x 5½ inches. Maximum speed 40 miles per hour. Equipment complete, as shown in cut, not including water hose. Price complete, $5,500.

| Capacity | Wheel base inches | Tread inches | Tires inches | No. Cyl. | Cylinders | H. P. | Weight Chassis | Price of Chassis | Seating capacity | Price of stake or furniture body |
|---|---|---|---|---|---|---|---|---|---|---|
| 6,000 | 144 | 7 | 36x5 | 4 | 5½x5½ | 50 | 5,600 | $4,[illegible]00 | 14 ft. x 72 in. | $350.00 |
| 5,000 | 134 | 67 | 36x4* | 4 | 5½x5½ | 50 | 5,400 | 4,000.00 | 14 ft. x 72 in. | 300.00 |
| 4,000 | 140 | 67 | 36x3½* | 4 | 4¼x5½ | 40 | 5,100 | 3,750.00 | 12 ft. x 72 in. | 250.00 |
| 4,000 | 125 | 60¼ | 34x4 | 4 | 4¼x5½ | 40 | 4,200 | 3,300.00 | 10 ft. x [illegible] in. | 250.00 |
| 3,000 | 100 | 56 | 34x3½ | 2 | 5x7 | 20 | 3,260 | 2,600.00 | 9.3 ft. x 56 in. | 300.00 |
| 2,5[illegible] | 97 | 56 | 32x3½ | 2 | 5x7 | 20 | 3,100 | 2,200.00 | 9.6 ft. x 44 in. | 300.00 |
| 1,500 | 85 | 56 | 32x3 | 1 | 5x8 | 8 | 1,800 | 1,400.00 | 7.3 ft. x 44 in. | 200.00 |

* These cars have dual tread tires on the rear wheels.

apparatus included. The 1909 line includes also a police patrol and ambulance which was not finished in time for photographing when this description was written, but which will be illustrated in the February "Journal." Some of these are here illustrated, the captions including the main specifications in each case.

The Knox Company will offer for the season of 1909 an all new 1909 Fire Wagon, the largest yet produced, $7,000; a lighter Fire Wagon, $6,500; also an all new 1909 Model; a third Fire Wagon, 1908

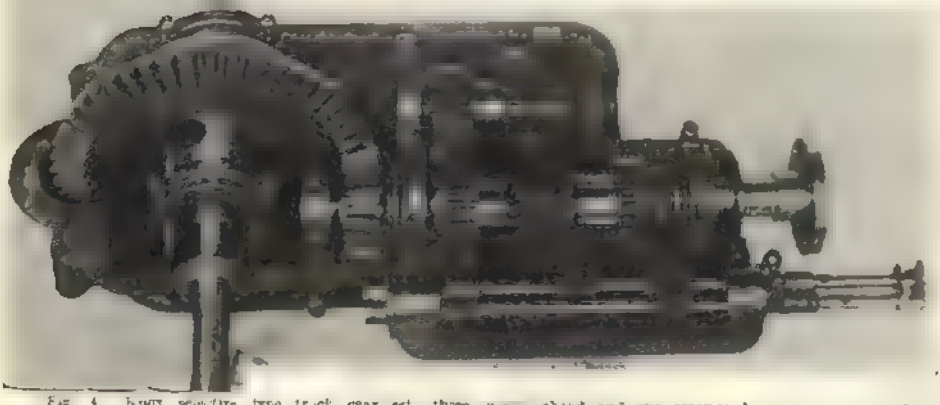


Fig. 4. Knox sliding fire type truck gear set; three speeds ahead and one reverse; large gears are used and they are made of nickel steel. Timken roller bearings; clutch encased in flywheel.

ent features of each type of chassis furnished. One of the 4-cylinder and one of the 2-cylinder chassis are illustrated in the engraving at the head of this article.

A most interesting group in the Knox commercial line is the assortment of fire model continued, $5,000; a fourth all new 1909 Fire Wagon, $4,500; a fifth 1909 model, all new, a Fire Wagon on pneumatic tires, $5,500; a Fire Department "Auxiliary Squad" Motor Car with seats for 6 passengers and a driver, new 1909 model,

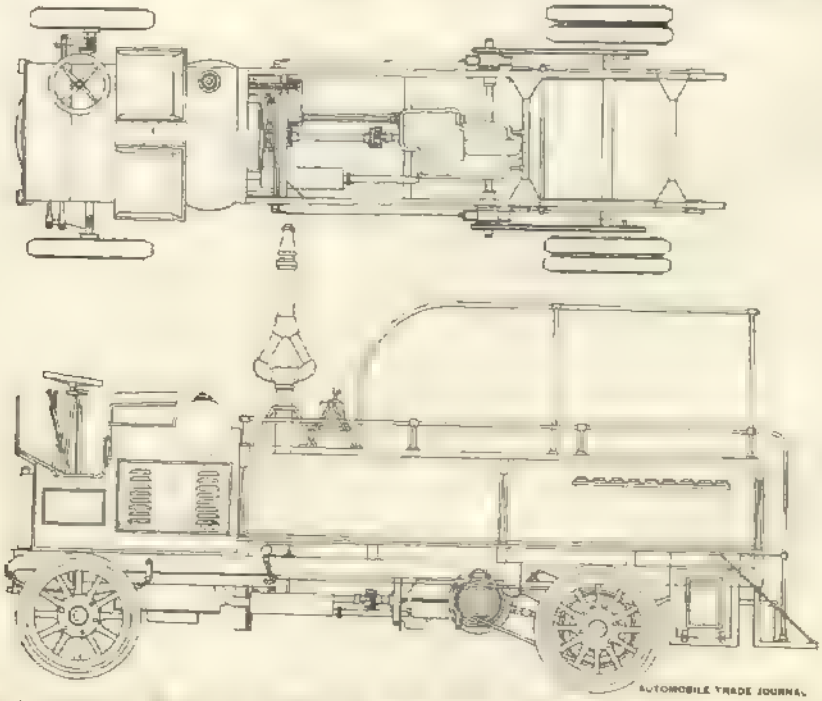
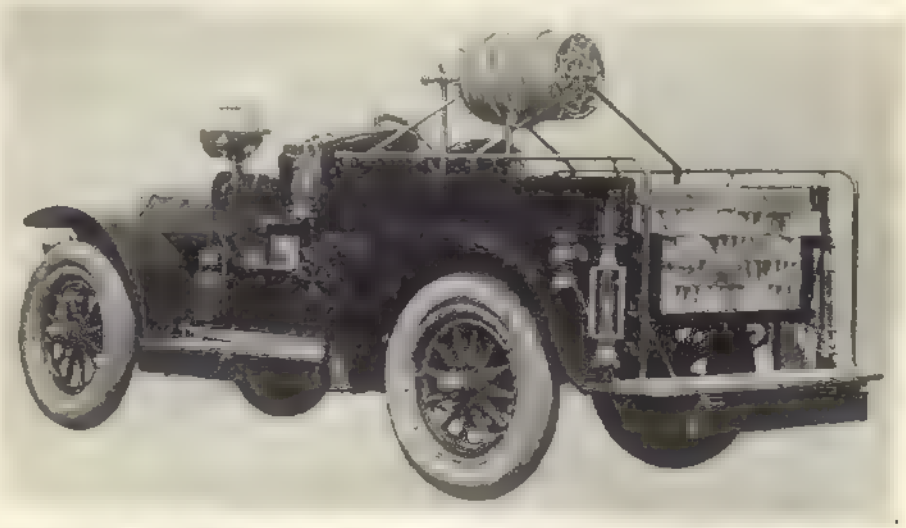


Fig. 5. Knox extra size fire wagon fitted with motor-driven pump and carrying 3,000 feet of 3-inch hose. May be equipped with chemical tank; can carry 20 passengers; speed 25 miles per hour. Wheel base, 14 ins. gauge, 56 ins. Tires all solid 5x4 ins. front, dual 36x3½ ins. rear. Motor 4 cylinders, 4 cycle water cooled 60 H. P. The drive is a clutch to the 3 forward speeds and a reverse sliding gear box, bevel gear to countershaft with bevel balance gear and sprockets and side chains to the rear wheels. Weight about 8,000 lbs. Price, without pump, $7,000. Price, with pump, about $8,000. Chassis plan is shown above car cut.

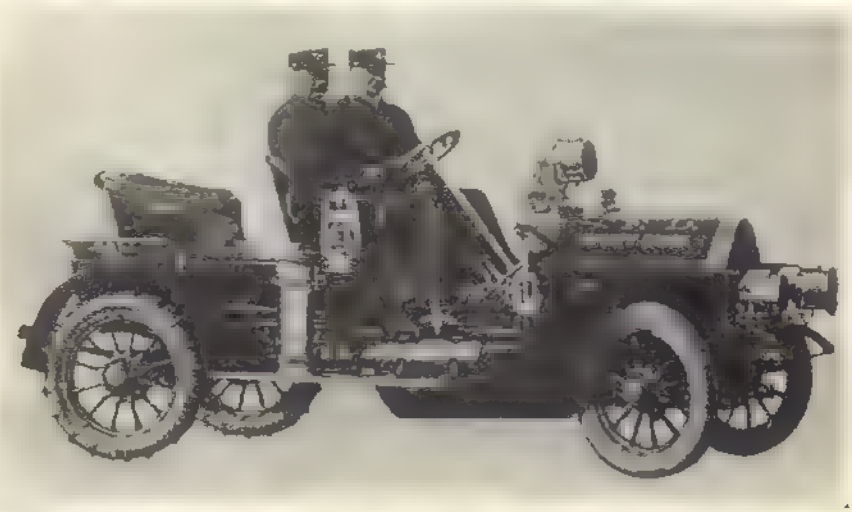
$4,500, a Fire Chief's Car, continued from 1908, seats for 3 passengers and a driver, $2,750; a Police Patrol Motor Car, an all new 1909 model, 9 passengers and a driver, $4,650; and a full line of motor ambulances, comprising four different models at from $4,000 to $5,000 each, none of these Knox 1909 model motor ambulances being ready for illustration at the time of writing, December 7, 1908, but all of which will be ready for delivery early in 1909



Knox Model G Commander Car. Capacity [illegible] feet water hose and five men. Wheel base, 112 inches; gauge, 58 inches; tires, pneumatic, 40 x 4 inches. Risk Heavy Car Type, with demountable rims. Engine [illegible] 30 miles per hour. Equipment, one 35-gallon chemical engine, 200 feet hose, reel and nozzle, pony extinguisher, axe, door opener, lanterns, etc. Price, complete $5,500.

concern in the world, is the outcome of long continued and costly experiments and successful constructions constantly improved, continued with vigor and unremitting care since July, 1906, when the possibilities of the motor car for city departmental use began to be dimly comprehended.

The two larger 1909 Fire Wagons can have triple plunger pumps driven by the car propulsion motor itself, so that the one fire wagon can be a complete fire fighting assembly, including a hook and ladder equipment, chemical engines and a power-



Knox 309 H. P. Chief's Car. Capacity three persons. Wheel base, 102 inches; gauge, 56 inches. Tires, 32 x 4 inches. Engine, cylinders, four 4¾ x 4¾ inches. Maximum speed, 45 miles per hour. Equipment complete as shown in cut including hose. Price, $2750.

This extensive and varied line of Knox Civic Motor Vehicles, the largest and most complete yet offered by any automobile

ful water throwing pump, driven by the vehicle motor itself, an air-cooled or water-cooled motor of from 40 to 60 H. P.

The Knox engineers regard the air-cooled motor as the more suitable for fire wagons, as in winter the emergencies of fire fighting may lead to neglect of the wagons resulting in freezing of radiators and water jackets

Fig. 8. Detail view of Knox Truck front axle, steering connections, spring, etc.

The Knox Municipal Motor Cars were received with instant favor, and are now in use in the following cities of the United States: Wayne, Pa.; Newburgh, N. Y.; Hartford, Conn.; Thompsonville, Conn.; Boston, Mass.; Chicopee, Mass., and Springfield, Mass

This line of Knox Municipal Vehicles for 1909 is very greatly improved in details and is shown in much larger sizes for 1909 than before, and it may be safely said that no city can afford to use horse drawn vehicles for the purposes to which these 1909 Knox Municipal Motor Cars are adapted.

## FIVE MOTOR CARS REPLACE NINE HORSES USED BY THE SPRINGFIELD FIRE DEPARTMENT

The Springfield Fire Department, of Springfield, Mass., placed its first automobile fire engine into service 26 months ago. Now it has five machines in service, all manufactured by the Knox Auto Co. Three of the machines are rated at 40 horse power and two at 25. All are 4 cylinder gasoline machines with the motors located in front under the hood. The loads carried by the various machines differ in weight according to the purpose for which they are used, ranging from 600 to 4,000 pounds, or an average of 1,860 pounds. The machines are run over a radius of 36 square miles, and average each 2 1-5 trips per day. On an average of 38 gallons of gasoline and 2 gallons of lubricating oil are used per car per month.

The five cars now in use replaced 9 horses and 5 vehicles, consisting of hose wagons and chiefs' wagons. The vehicles cost $1,500 and $2,500, according to type. Horses cost $300 each and harness $100 per set. Cost of feeding each horse per month was $12 and the average monthly cost of shoeing each horse was $5.

The most needed improvement in motor cars suggested by their experience is the fitting of cars with self-starting devices. This department says the advantages of the motor car over the horse drawn vehicle consists of unlimited distance in travel, speed, and no horses to care for at fire.

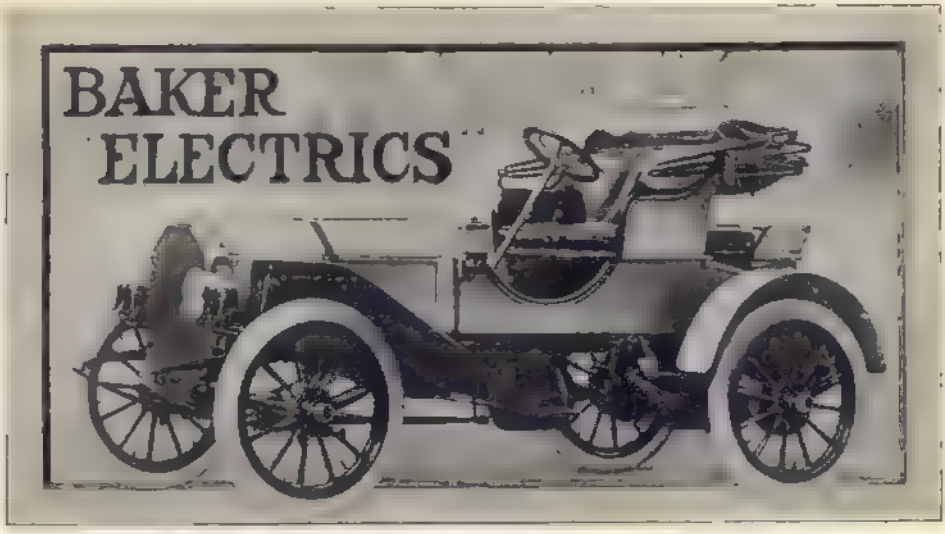
## A PHYSICIAN'S EXPERIENCE WITH MOTOR CARS

A. D. Hard, M. D., Physician and Surgeon of Marshall, Minnesota, has used motor cars for the past 10 years, in which time he has owned seven different cars. The cars he used were mostly of the buggy type variety, costing from $400 to $1000. He usually carries two persons Two trips are averaged daily, covering about 20 miles. Gasoline costs on an average of $3.00 per month, and lubricating oil 60 cents.

Dr. Hard formerly used 4 horses and 2 teams of single and double top buggy type. On an average 12 miles were made per day, and an average of 1½ trips. The cost of each vehicle was $90.00; horses, $175.00 each; harness, $20.00 per set; monthly cost of care and feed of each horse, $12.00; average monthly cost of shoeing each horse, $1.50, and repairs to each vehicle, $1.00. Dr. Hard suggests that cars for his profession should have four wheel drive—greater clearance—4 cylinder, 30 H. P. motor, extra soft springs—solid tires and should be air cooled. He says the motor car saves time, is more comfortable and less expensive than the horse.

## PHILADELPHIA AUTO BUS LINE IN RECEIVERS' HANDS

The Auto Transit Co., of Philadelphia, Pa., which has been operating electric auto buses on Broad street for more than a year, has been placed in the hands of a receiver. Application was made by the Electric Storage Battery Company, a creditor, and Judge Magill of Court of Common Pleas No. 1 appointed the Commercial Trust Co. and George McCurdy receivers. The cause of the failure, General Manager Peter J. Hughes admits is that the expenditures of the company exceed its receipts. The debts of the concern aggregate $80,000, while the assets, which include the Company's barn and forty-five buses, are valued at $330,000. It is said that the receivership is simply a move for reorganization and that the company has not permanently quit business.




BY P. S. TICE.

Several new models and types have been added to the line of electric cars manufactured by the Baker Electric Vehicle Co., Cleveland, Ohio. Briefly specified, this line of cars now includes a Queen Victoria of 71 inches wheel base with pressed steel frame mounted on semi-elliptic front and full elliptic rear springs and fitted with 32 by 3½-inch pneumatic tires, front and rear, which sells for $1850. The chassis upon which this Victoria body is mounted is powered by a battery of 24 cells, 9 MV, and a General Electric series wound motor of 2 rated horse power which is capable of carrying a 300 per cent. overload. Steering is by side post and horizontal lever; and speed controls, six forward and three reverse, with a maximum of 20 miles per hour, are had through a vertically placed lever at the side of the seat. Motor speed is reduced to a countershaft by a Reynold silent chain and the final drive to the rear axle differential is by single roller chain. This chassis, designated as P 1, is also fitted with a straight front coupe body with inside control, and when so fitted sells for $2250. These two bodies, the Victoria and coupe, are interchangeable and make possible the possession of a summer and winter car with a single chassis. The P 1 chassis is sold separately for $2000, the Victoria body for $300, and the straight front coupe body for $800. A photo herewith, Fig. 1, shows this chassis fitted with the Victoria body.

A chassis similar to the P 1 with the exception of the provision of a larger battery, 28 cells, 9 MV, and a 2½ H. P. motor with 300 per cent. overload capacity, is fitted with an extension front coupe body, also shown in an accompanying photo. This body provides considerably more room inside than is had with the straight front coupe and has an additional seat so that four passengers can be comfortably accommodated. The extension front coupe, inside controlled, with capacity for four passengers and mounted on the larger capacity P 2 chassis, is sold for $2500. In all Baker chasses there are several features that are the same—such as brakes and brake control, speed controller, drive chain adjustment, etc.—and these will be taken up in detail after the various types of body have been described.

The I chassis, which sells for $2500 when fitted with either a four-seat brougham or landaulet body, is considerably different from the P 1 and P 2 chassis in that it is much heavier, larger and higher powered. This chassis is of 89 inches wheel base and 56 inches tread, mounted upon semi-elliptic springs front and rear and wheels of the artillery type fitted with 34 by 4-inch front and 34 by 4½-inch rear pneumatic tires. The frame is of pressed steel. Steering is by a large wheel mounted on an inclined post which also carries the speed controller lever. In this chassis, the motor is of six rated horse power and is supplied by a 40 cell, 11 MV battery. The motor, which is also of 300 per cent. overload capacity, is carried in front and drives a long doubly jointed propeller shaft through a Reynold silent chain reduction. The bevel driving gears and differential are inclosed in a casing in the rear live axle structure and drive the wheels through semi-floating shafts. Each rear wheel carries two brakes, an external band operated by a foot lever, ratchet retained, and a second internal expanding set operated by a side lever. The driver's seat is almost over the front wheels, leaving room for a large comfortable body enclosure. If an average speed of 12 miles per hour is maintained, the

battery capacity is guaranteed to give a mileage of 50 on a single charge, while 40 miles is guaranteed with a speed of 16 miles per hour. The maximum speed of the car is 20 miles per hour.

Another type of chassis is made, retaining the forward placed motor and propeller shaft to bevel rear axle, 92½-inch wheel base with standard tread, mounted on semi-elliptic springs, front and rear and fitted with 36 by 3½-inch front and 36 by 4½-inch rear pneumatic tires, 2½ H. P. motor and 28 cell, 9 MV battery, with side steering post and lever, and is fitted with either a coupe or depot carriage body, each having an unenclosed driver's seat. With coupe body this chassis is sold for $2,200, and with depot car body for $3,000

foregoing cars, the trimming being in broadcloth to match the panels. Materials and workmanship employed in painting and trimming of Baker cars are of the best obtainable.

A DISTINCT DEPARTURE

The two latest Baker models, M and S, are a distinct departure from accepted electric car designs, at least in so far as the appearance is concerned. Recognizing the growing demand for cars of smart and snappy appearance, the Baker Co. has produced these two models, which resemble the popular high powered gasoline roadster and light runabout, respectively.

The M has the long, low racy look of a six-cylinder roadster and is fitted with a rumble seat roadster body, as shown in the title cut. With full equipment, elec-

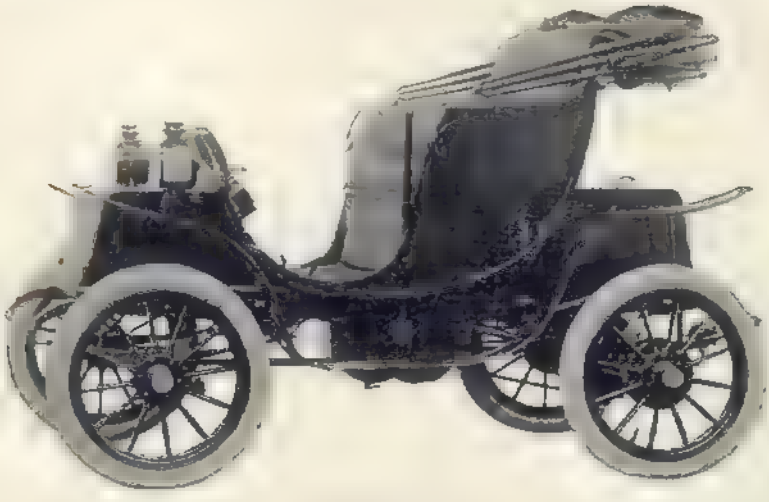


Fig. 1. Queen Victoria Baker Electric. Side lever steering and speed control, finished in black with green or blue panels and running gear, with trimmings to match, top either full V or open. Price $1350. General Electric motor battery 24 cells. 9 M. V

A second chassis, which is in every way similar to the one just described, with the exception of the wheel base, which is 86½ inches, may be had with Victoria body and rear, elevated driver's seat for $2000, or with surrey body for $2200.

The Baker Suburban, which seats two, is mounted on a chassis similar to the Victoria or surrey, except that the battery is of 28 cells, 11 MV, to secure a greater mileage per charge.

The smallest chassis built by the Baker Co. has 68-inch wheel base, full elliptic springs throughout, 30 by 3½-inch tires front and rear, side steering post, 1¼ H. P. motor and 14 cells, 9 MV battery The controller gives three forward speeds and the same number in a reverse direction. Drive is by single roller chain, and a capacity of 40 miles per charge is guaranteed. This chassis with Stanhope body is sold for $1000, and with a small straight line Imperial body for $850

Black with panels of blue, green or maroon are the standard colors for all the

tric headlights, side lights and tail lamp, top and shock absorbers, this car is sold for $2,500.

The frame is of armored wood mounted on semi-elliptic springs, front and rear The wheel base is 95 inches with standard 56-inch tread. Tires are 34 by 4 inches front and rear. A series wound motor rated at 3½ H. P., with overload capacity of 300 per cent., is supplied by a 40 cell, 9 PV battery. The speed controller, with operating lever under the steering wheel, gives nine speeds forward and three reverse, with a maximum speed of 30 miles per hour. Seventy miles per charge is guaranteed at an average speed of 15 miles per hour.

In this car, the motor is hung under the floor boards and drives the rear axle bevels through a short propeller shaft on which is mounted a drum for one of the two brakes, the other brake being internal expanding in the rear wheel hubs. In this car, as well as in all Baker cars, the motor armature shaft, the counter

shaft, rear axle shafts, and wheels are mounted on imported annular ball bearings. The standard M roadster is delivered with blue body and yellow gear, the trimming being in best grade of leather.

Fig. 2. Baker Extension Front Coupe. Inside control by side levers. Finished in black with blue, green or maroon panels. Trimmed in broadcloth to match body coloring. Price $2500.

MECHANICAL DETAILS

All detail discussion of the distinctive Baker features has been avoided in the foregoing. In the following matter, however, will be found a description of most of these features; and, while they are here taken up in connection with the S runabout, they are the same in all chain-driven Baker cars with the exception of the chassis of the Stanhope and Imperial.

clean-cut general appearance of this car, which promises to be a prominent Baker leader. It is here shown fully equipped as delivered to the purchaser at a cost of $1850, f. o. b. Cleveland.

The frame is of pressed steel channels with five cross members. Between the two end members and those adjacent to them are placed the slat floors which support the two battery units. This method of carrying the battery, in two sections, one at either end of the car, gives an almost perfect distribution of weight to the axles and wheels and very materially adds to the stability of the car and renders it almost immune from skidding.

The wheel base is 71 inches with 56-inch tread. Wheels are of the artillery type and fitted with 32 by 3½-inch pneumatic tires. Semi-elliptic front and full elliptic rear springs are employed. The front springs are attached to the frame in the usual manner, and seat upon spring perches brazed to the axle tube, as are the Elliot type steering knuckles. The tie rod for the steering arms of the wheel pivots is located at the rear of the axle, and the steering link from the gear arms diagonally forward to a second lever arm integral with the right hand wheel spindle. All joints in both the steering link and the tie rod ends are ball and socket provided with ready means for taking up wear. The front wheels are each carried on two races of annular balls.

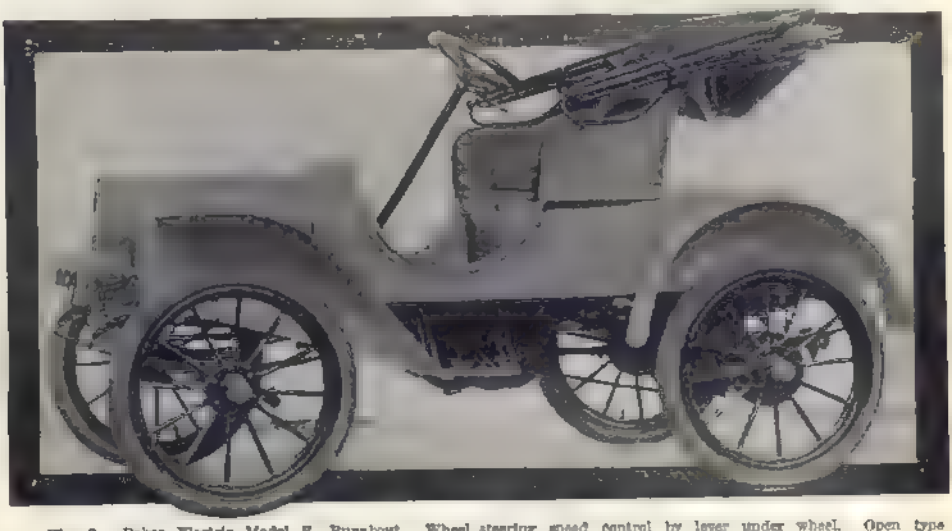


Fig. 3. Baker Electric Model S. Runabout. Wheel steering, speed control by lever under wheel. Open type top. Electric headlights, side lights and tail lamp. This model and the model M shown in the title cut are departures in electric vehicle designs, resembling as they do the popular high powered, gasoline roadsters. Tires 34 x 4 inches. Armored wood frame; 3½ H. P. motor. Overload capacity 300 per cent. 40 cell 9 P V battery. Nine speeds forward. Maximum 30 miles per hour, 70 miles per charge, guaranteed at an average of 45 miles per hour. Price $1850.

S. RUNABOUT DETAILS

The photo of the S runabout, Fig. 3 gives a very clear idea of the snappy,

Between the third and fourth cross frame

members are two longitudinally placed members which form a sort of sub-frame to which the motor is suspended. This suspension is flexible and provides a peculiar advantage, as will be shown later. The motor is a General Electric rated at 2½ H. P. and capable of a 300 per cent. overload. As shown in the view from beneath the chassis, Fig. 4, a countershaft driven by enclosed Reynold silent chain gives the first reduction between the motor armature shaft and the wheels. This countershaft is mounted in two imported annular ball bearings, as is also the armature shaft itself, and all these bearings, as well as the Reynold chain, are completely enclosed and protected

Upon one end of the countershaft is secured a sprocket pinion over which runs a high-grade roller chain which drives the sprocket gear attached to the differential

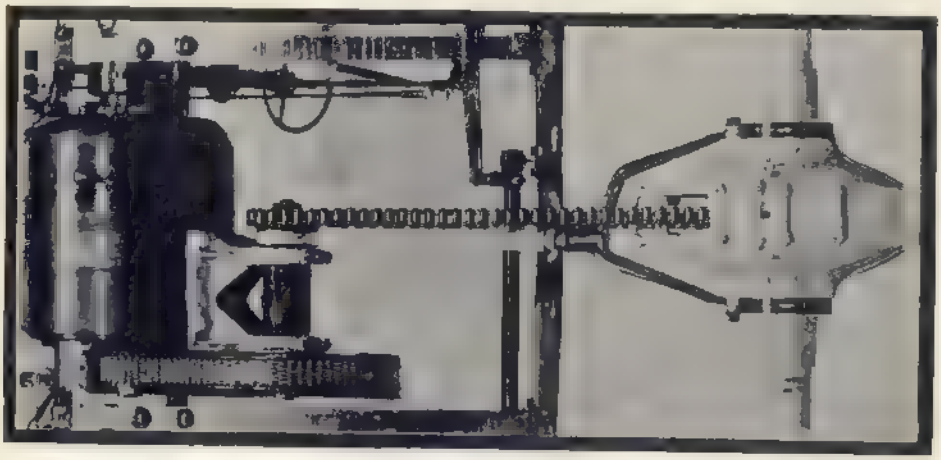


Fig. 4. Under side of Baker Electric power plant, showing motor, Reynold silent [illegible] reduction (lower half of case removed). Single roller chain transmits power to rear axle sprocket and differential [illegible] Radius rod for general adjustment without moving rear axle, as described in text

within a housing formed in the rear axle center. The rear axle is of the conventional semi-floating type with shafts mounted in annular ball bearings, and is maintained in proper relationship with the frame and front axle by long non-adjustable radius rods. These rods are made right as to length, once for all, at the factory, and thereafter it is never necessary for the user to change them for the purpose of taking up chain slack, with the ever present possibility that when the slack has been taken up the axles will be out of parallel, which induces rapid tire wear. The motor suspension and a third radius rod are made to take up all chain wear without disturbing the relationship of the axles and frame

### CHAIN ADJUSTMENT

In the plan view of the chassis, Fig. 5, it will be noted that the motor is suspended from the sub-frame members by a tube attached to them at its ends. This tube is clamped to the motor casing but is free to rotate in the boxes provided for its ends. In the under view of the chassis is seen the driving chain and a central radius rod with a yoked rear end. The forward end of the radius rod is bored out to embrace the casing of the countershaft and the two ends of the rear forged yoke are bored out to embrace turned surfaces on each side of the differential housing and split after the manner of the eccentric straps of a steam engine. Just forward of the yoke is a heavy right and left threaded bolt with a hex at its center. When the chain has become slacker than it should be, through wear, the split clamp shown integral with the forward part of this radius rod is loosened and the oppositely threaded bolt turned till the chain is sufficiently tight, when the clamp is again locked. In making this adjustment, it is apparent that the axle has not been moved, but, instead, the motor as a whole has been pushed slightly forward about the suspension bar as a pivot

### CONTROL

The steering gear, which is shown in place in the car, as well as in detail, in Fig. 6, with the cover plate removed, is of the internal gear and pinion type and is operated through an enclosed and inclined shaft carrying a large hand wheel at its upper end. The internal gear is carried on a spindle which has a long bronze bushed bearing at each end. The pinion is integral with the lower end of the steering shaft and is carried in an eccentric bushing, by means of which wear and backlash are readily taken up. Enclosing the steering shaft or post is a polished brass sleeve having secured to its upper end the speed controlling lever and to its lower end a bronze mitre gear. This latter meshes with a second gear on the spindle of a drum controller located under the inclined toe boards of the car. The lever at the upper end of the sleeve works over a plain ring provided with a deep notch at the neutral point to obviate the

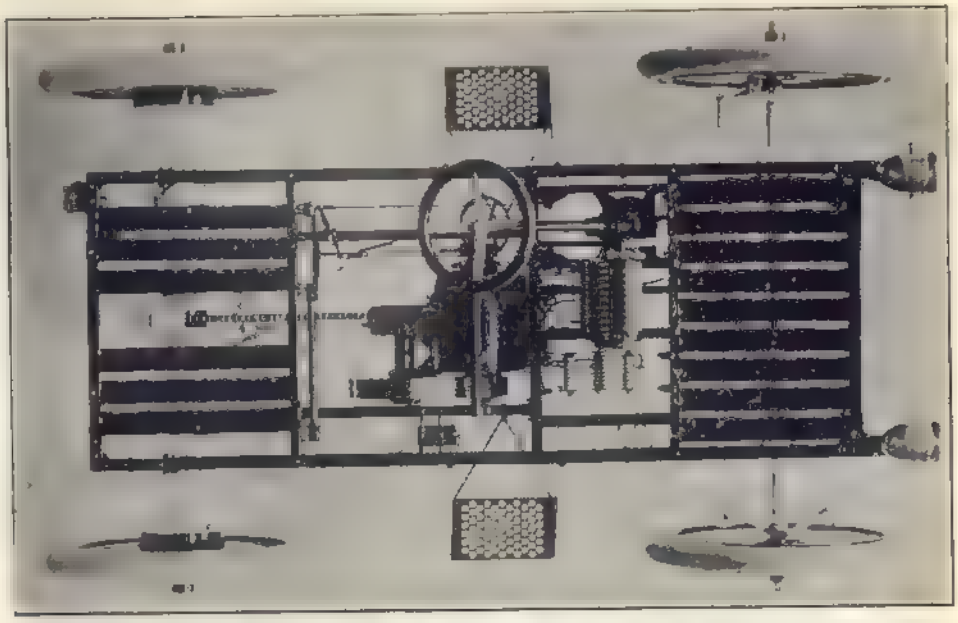


Fig. 1. Plan of S R [illegible] and rear, and giving acreage [illegible] of parts with body in [illegible] the inclined boards and the motor under the main floor leaving the space [illegible]

possibility of an inadvertent engagement of the reverse coil as when shifting off power while running ahead, or vice versa. The drum controller is extremely well built and insulated and the progressive contacts are so made in its operation that no jerking of the car or sparking at the contacts is possible. From the time of making of the first or lowest speed contact, to start the car, no cessation in the driving torque is had as successively higher speed contacts are made. The first two of the six forward speeds utilize the resistance coil or box, shown at the right of the controller in the chassis plan, but the last four, giving speeds of 13, 16, 18 and 22 miles per hour respectively, are made without resistance. The battery cells are at all times in series. While the neutral point is located by the shift lever pawl falling into a notch, as above, there is on the end of the controller spindle, opposite the shifting gear, a segment with notched periphery and a roller-ended, spring-retained, lever which drops into these notches and serves as an indicator and retainer of the controller position.

### Brakes.

Two foot-operated brakes are fitted. The pedal under the right foot operates thru a lever and return linkage (chassis plan) a contracting band on the end of the motor armature shaft. This brake is very powerful because of the high speed of this shaft relative to the speed of the wheels. The pedal operating this motor brake is spring returned to the off position when foot pressure is withdrawn. The second set of brakes are internal expanding shoes within the rear wheel hub drums. These are balanced in the usual way by a whiffle-tree device, and the pedal operating them automatically locks itself when pushed forward. To release or keep the ratchet from acting during momentary stops, a slight pressure toward the right is applied against the pedal as it is pushed forward.

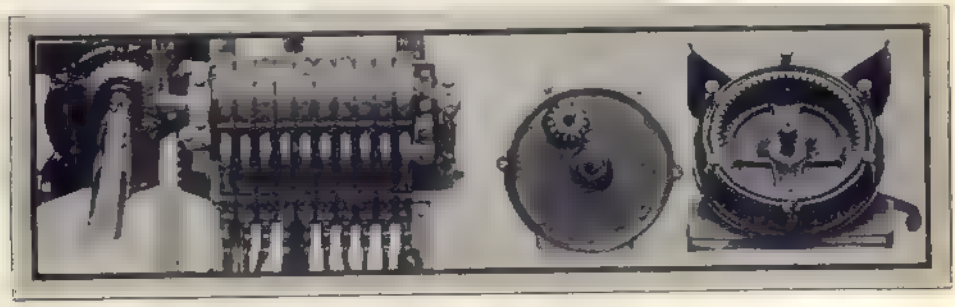
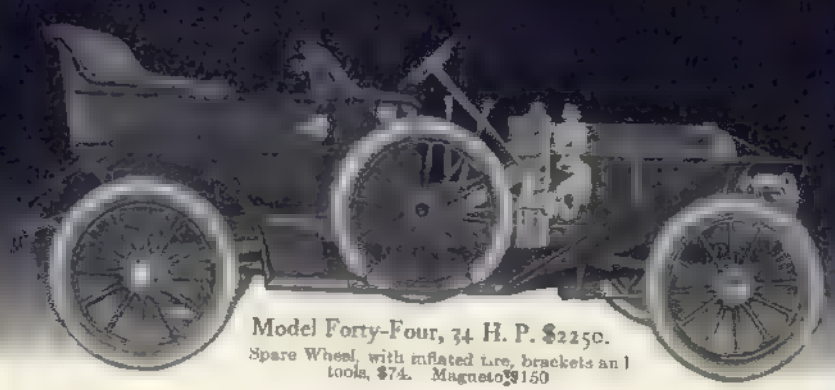


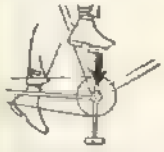
Fig. 2. Showing at the right, details of the Baker electric steering gear, which is of the pinion and internal gear type fully described in the text. At the left is illustrated the speed controller, which is operated by a lever under the steering wheel.



Model Forty-Four, 34 H. P. $2250.
Spare Wheel, with inflated tire, brackets and tools, $74. Magneto $150

# THE OFFSET CRANK SHAFT

Most automobiles develop sufficient power when they are traveling at a *high* speed. The greatest need is for power at *slow* engine speeds. Rambler Model Forty Four can be operated smoothly and steadily at *three* miles an hour on *high* gear. This is because of the offset crank shaft.



Corresponds to position of piston in ordinary engine at explosion center.

Corresponds to position of piston in Rambler engine at explosion center.

**Rambler**

**The Car with the Offset Crank Shaft**

**Ordinary Engine. Position of piston at explosion center.** Explosion exerts no turning effort to crank shaft. The dead center wastes energy. Shock falls on bearings.

**Rambler Offset Crank Shaft. Position of piston at explosion center.** Full power of explosion exerts turning effort to crank shaft. Dead center eliminated. No energy wasted. No shock to bearings.

Seven passenger model, forty-five horse power with offset crank shaft, $2500. Other models $1150 to $2500. Write for catalog describing Rambler offset crank shaft, Spare Wheel, straight line drive and other features of the new Rambler

## THE CAR OF STEADY SERVICE

***Thomas B. Jeffery & Co., Main Office and Factory, Kenosha, Wis.***

*Branches and Distributing Agencies:*
Chicago, Milwaukee, Boston, New York, San Francisco. Representatives in all leading cities.

# The Corbin 1909 Cars

HUGH DOLNAR

The Corbin Motor Vehicle Corporation, New Britain, Conn., U. S. A., will offer for the season of 1909 a 7-passenger touring car, a limousine, a town car and a landaulet on a chassis of 114 ins. wheel base, 34 x 4 inch tires all round except 34 x 4½ ins. for the landaulet rear wheels, and will place on a 108-inch wheel base chassis a 5-passenger touring body, a 4-passenger runabout and a "baby tonneau" body to seat four or five passengers. All of these seven Corbin 1909 models will be driven by the same 30 H. P. motor, four cylinders, 4½ x 4¼ ins., 4-cycle, water-cooled, will have the same selective 3 forward speeds and a reverse sliding gear speed change, and the same bevel gear rear axle. The motor, the sliding gear and the front and rear axles are all built by the Corbin Corporation at the New Britain factory, of the best materials. Special care has been given to the motor design, which embodies many unusual features of obvious advantage.

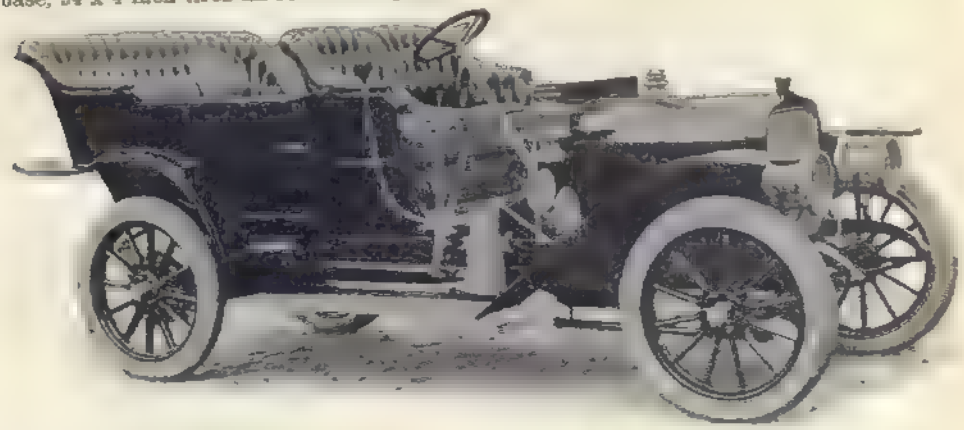


Fig. 1. Corbin 7-passenger touring car. Wheel base 114 ins., 56 ins. gauge, tires all 34 x 4 ins. Motor, 4 cylinders, 4½ x 4¼ ins., 4-cycle, water-cooled, 30 H. P. at 1[illegible] R. P. M. selective sliding gear, 3 forward speeds and a reverse, with bevel gear to the divided semi-floating rear axles, mounted at both outer and inner ends. Weight 3700 lbs. Price, $2,750.00, including 5 lamps, generator, mats, horn and tools ready for extended touring. Tire top extra.

## NOTABLE FEATURES

The Corbin cars were first put out with air-cooled, 4-cylinder motors, 3¾ x 4¼, about 70 lbs. compression, rated as 16-20 H. P.; afterwards enlargements were gradually made up to 4½ x 4¼, air-cooled, rated at 30 H. P., these last air-cooled, 30 H. P. motors being yet offered by the Corbin Company. These motors cool perfectly and many purchasers could not now be induced to drive a water-cooled, motor-driven car. The Corbin engineers firmly

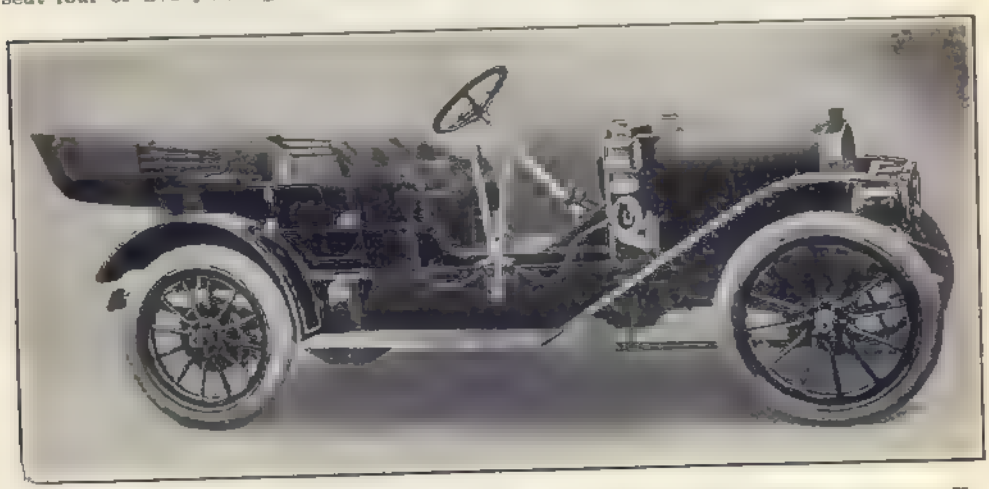


Fig. 2. Corbin 1909 Baby Tonneau, to seat four, can carry five passengers, wheel base 108 ins., gauge 56 ins., 34 x 3½ in. tires front, 34 x 4 in. tires rear. Motor 30 H. P. sliding gear and bevel gear to divided rear axles, all same as Fig. 2. Weight about 3300 lbs. Price $3,650.00 with 5 lamps, mats, horn and tools, all ready for the road. With touring car body, weight 3,950 lbs., $3,500.00. Cape top as ordered.

believe in the superiority of air-cooled motors and are therefore yet offering them to prospective purchasers, although in deference to the apparently strong popular prejudice against air cooling, the present water-cooled, four-cylinder motor cylinders 4½ x 4¼ ins was placed on the road in 1907, and is offered as the regular Corbin car motor for 1909

It is true that some forms of air-cooled car motors could use only a low compression, and even with the low compression did not cool well, and were unreliable, and it was because of these imperfectly air-cooled motors that a prejudice was established against air-cooling in general, although there have been perfectly satisfactory air-cooled motor-driven cars offered by successful manufacturers for several years past and the general disapproval of air-cooling is, in fact, based on ignorance of what has been done But as the prejudice does exist, the Corbin management found it expedient to put out the water-cooled motor here shown, which has many notable features

The Corbin motor has individual cylinders standing on an aluminum base, to one side of which the aluminum cam-shaft support and housing is applied The crank shaft journals are not carried by the motor base, as is the almost universal practice, but are 5 journal boxes in the aluminum oil basin; the front and rear journals of the crank-shaft being in annular ball bearings with three plain bearing, Parson's white bronze, between the two annular bearings. The bolts which hold the cylinders to the motor base are long enough to go entirely through the oil basin, heads underneath and nuts on top of the cylinder lugs, so as to place the aluminum oil basin and motor base in compression The cams have horizontal lever riders on top, no cam rollers, the riders transferring the cam action to short lifters containing spring plungers which impinge the valve-stem lower ends so as to ensure continuous contact the plunger springs being so light as not to interfere at all with valve seating

The clutch has 3 light coiled engagement springs which act from a front crank shaft flange and ball thrust bearing to push the clutch cone forward The clutch is disengaged by a rocker with two arms carrying ball bearings which impinge a plain flange integral with the 3-coiled spring spider,

The change gear is all hard all 7 d. p., and is all ⅜ in face is selective 3 forward speeds and a reverse.

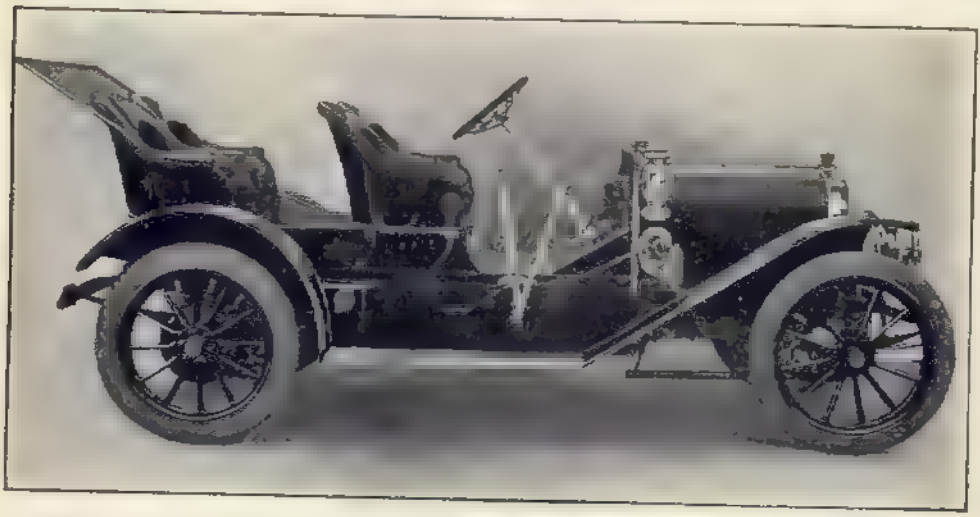


Fig 2 Corbin 1909 Runabout, to seat four passengers, 108 ins. wheel base, tires 34 x 3½ front tires 34 x 4 rear tires. 30 H P. motor, sliding gear and bevel gear to divided rear axles, all same as Fig 1. Weight about 2,250 lbs. Price $2,500.00, including 5 lamps, mats, horn and tools, all ready for the road

The two rear "bucket" seats are individual and can be removed and the revolving seat placed in the middle or a single rumble seat may take the place of the two rear bucket seats. Top is as ordered extra

The chassis frame is pressed steel, sides parallel, raised at the rear ends over the rear axle in the 114 inch wheel base model and straight on top in the 108 inch wheel base model. The springs are half elliptics in all the Corbin 1908 models, with triple action in the rear for the 114-inch wheel base only

THE CORBIN 1909 WATER COOLED MOTOR

This carefully designed motor was placed on the road in 1907 was the regular motor for 1908, and will be continued through 1909 with no changes of importance The cylinders are 4½ x 4¼, and show better than 30 H P at 1200 R P. M.

The individual gray iron cylinders are on an aluminum motor base surmounting an aluminum oil basin with two dual oil pits, all in usual manner, but the crank-shaft bearings are not in the upper half of the case but are in the oil basin, the upper half merely supplying caps for the

annular F. and S. ball bearings which carry the crank-shaft end journals. The oil basin is semi-cylindrical with cross members inside for carrying the three intermediate crank-shaft bearings in plain Parson's bronze bearings having individual

the gear box is spread at its forward end to bolt on the oil basin fly-wheel shield. The front end of the motor is suspended from an aluminum arched frame cross member, and the motor assembly rear end support is given by the gear box in unit

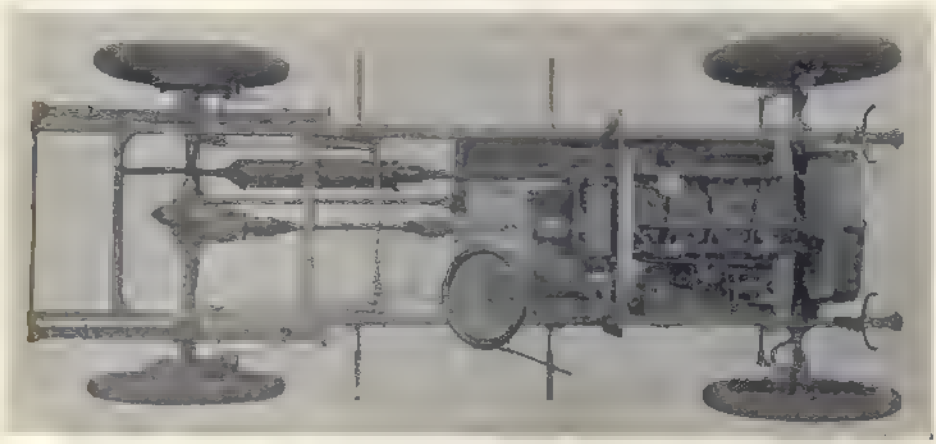


Fig. 4. Cadillac Chassis plan. The general arrangement of parts is the same for both lengths of wheel base. The frame is pressed steel, 5-32 side frame thickness and ¼ cross member thickness, greatest side frame depth 8¼ ins. for the 108 ins. wheel base, and 4½ ins. for the 114-inch wheel base.

The motor front end is suspended from an aluminum arched cross member while the rear end is bolted to the front end of the gear box in unit assembly, protecting the under side of the fly-wheel, clutch and universal joint assembly to the gear box line shaft. The aluminum gear box is, in turn, supported on one, channel-section, pressed steel, cross-girt

caps. The oil basin and motor base are held to the cylinder lugs by long through

assembly with the oil basin, resting on the second frame cross girt. Steel plates fixed to the chassis side frames and the motor oil basin serve to close the whole chassis front part against road drift.

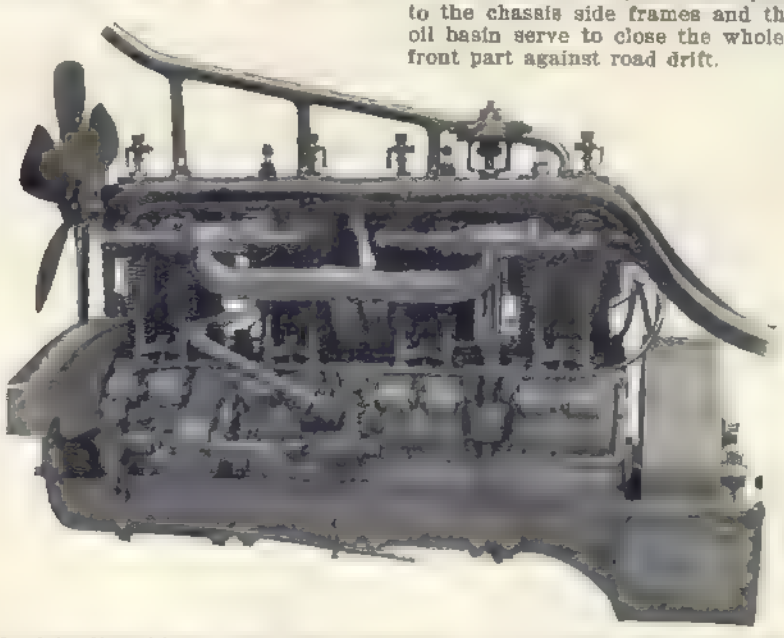


Fig. 5. Cadillac Motor, left side. The 2-pinion oil force pump at the left front of the cam-shaft housing and the two pinion water circulating pump at the middle, are driven by ball drivers from a spur gear train from the cam-shaft, all as clearly shown in this picture, giving the pumps a free drive.

The exhaust pipe, steel, 1⅝ ins. inside diameter, has its bends and delivery pipe all electrically welded into an integral structure, the cross pipes giving expansion mobility

bolts, heads under the oil basin, nuts on top of the individual cylinder lugs.

The rear end of the oil basin spreads to shield the lower half of the fly wheel, and

### THE VALVE ACTION

The valve lifters are in bronze guides, each pair held by one screw through the middle of a double fork strap. The ports

are all 1 9-16 dia. The valves are nickel steel, heads and stems integral, with constant contact spring plungers below the valve stem low ends (see Fig. 7). The coiled valve springs are coned at their lower ends and deliver their down-thrust to the valve stems through split-pins in the stems, no collars. It will be noted that the cam motion transmission parts and the valves and springs are all as light as possible, no cam-rollers and no spring collars, and the cross-motion is taken by the hardened cam-lever or rider, making a free lifter motion, while the spring plungers ensure constant contact, silence and small wear. Unquestionably, the valve action should have parts of as little weight as can be made to serve, to avoid hammer and anvil effect between the cam and valve face. It will be noted, Figs. 6 and 7, that the entire cam shaft action forms an individual unit assembly, which can be separately assembled and then applied to the side of the motor base, which is an important constructional advantage.

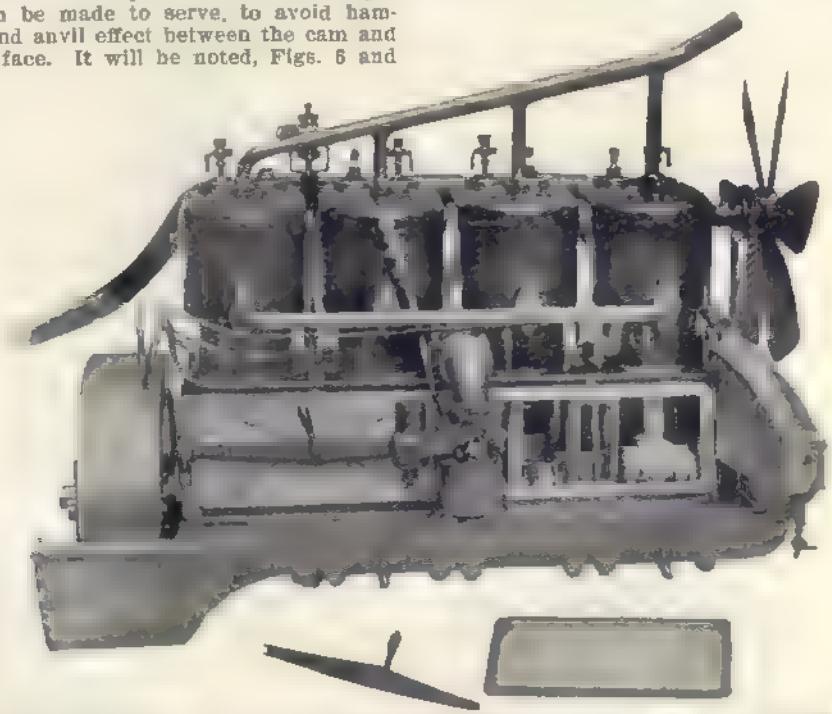


Fig. 6. Corbin 1909 30 H. P. motor, right side. The cylinders are individual units, cast with integral head and water jackets. The commutator is on a long vertical shaft, spiral gear driven from the cam shaft. The connecting rod crank-wrist caps are hinged at one end, access by removing the aluminum covers, which are held by pressed steel bars with their ends in hooked brackets, one screw in the middle. The plates are large and give free access to the crank-shaft and rod ends. The splash pits are fitted with drain screws. The oil basin is extended to the rear to cover the under half of the fly-wheel.

### CORBIN OILING SCHEME

The cylinder and rod oiling are by splash, two splash pools, each for two cylinders. In addition, each cylinder has an oil groove around it inside, always covered by the piston and supplied by an individual oil tube. The oiling scheme includes an oil reservoir under the toeboard, from which oil is forced by a two-pinion pump to a high reservoir on the rear side of the dash, with a return overflow from the high reservoir to the low oil tank. From the high reservoir oil descends through three needle valves, one oil lead to each dual splash pool and the third to the cylinder oil grooves. The pump and high reservoir give a uniform head of oil above the needle valves, ensuring regular delivery to the motor.

### THE 1909 DRIVE

The clutch is carried on a rear extension of the crank-shaft, on two circles of ¼ dia. balls. The clutch cone shaft, a steel drop-forging, transfers motion through an Oldham coupling to the gear box line shaft. The propeller shaft has Hartford universal joints at each end, and is 1⅛ ins. dia., solid steel. The live rear axles are 3.5 nickel steel, squared ends hardened, live axles "heat-treated," 1¼ ins. dia. solid. The stub axle and its vertical member are an integral steel drop forging, and the vertical member is not bored to take a pin, but is journaled at both ends, with a ball thrust bearing to take the load.

The Corbin bevel gear drive is very carefully designed, the bevel pinion being supported by two annular bearings in front and a third annular bearing in the rear. The balance gear is 8 spur pinions.

### THE SPRINGS

For the Corbin 1909 114-in. wheel base chassis the bodies vary so much in weight that the rear springs are varied for each

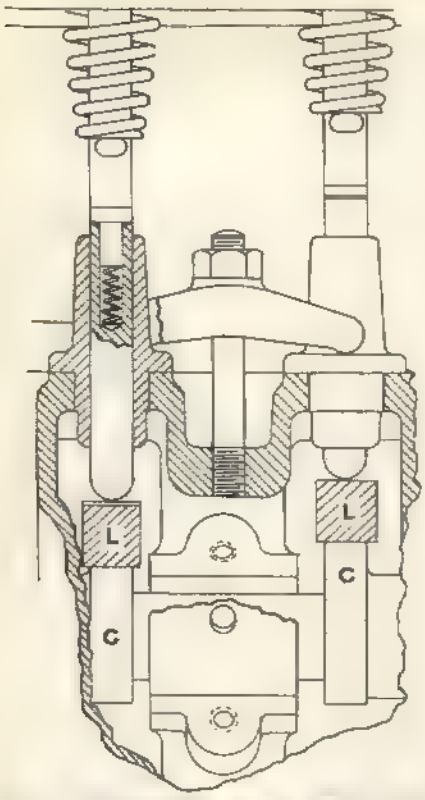



Fig. 7. This illustration shows the construction of the spring plunger seating. The cups are bored to receive the ball ended plungers carrying rubber cushioning washers, which bear on the spring plates. The ball ends of the plungers fit into the cups. The light coiled springs behind the plungers serve to maintain a constant contact between the plate steel and the cups. After the initial settling down of the cushioning washers, which is a slight one, the effect is to reduce vibration, noise and rapid wear.

model. The 114-in. wheel base chassis front springs are the same as for the 108-inch wheel base chassis

The front springs are half-elliptics, 40 ins. long x 2 ins. wide, either 5 leaves each ¼ thick, or 6 leaves, usually graded tongued and grooved, 3 leaves banded together, bottom leaf dowelled to the spring perch, no central hole through leaves and no central bolt, springs fixed on perches with two clips each, ½ in. clip-screws with hex. nuts on bottom, retained by screw end riveting. The springs are seated on interposed, gib-end, hollowed top, malleable casting pads, seated on top of the flat-faced spring perch. There is also a malleable iron strap on top of the spring, notched to take and retain the spring clip cross-members. The springs are jointed to the steel drop-forging side frame front eyes, and linked to the chassis frame brackets. The 40-inch front springs are perched 4 ins. out of middle, 16 ins. from front eye to axle centre. The spring eyes are bronze-bushed and the eye pins are case-hardened steel, spring oiler lubrication.

The 108-inch wheel base chassis rear springs are half-elliptics, 50 ins. long x 2¼ ins. wide, 9 leaves graded, same seat, cap, clips and dowels as front springs, save for increased width, and same clip nut retention. The rear springs are perched ½ inch off centre, are jointed to the chassis frame brackets in front, 25½ ins. from front spring eye to middle of spring perch on rear axle, and linked to the rear eyes of the chassis frame, which are steel drop forgings. Spring eye bushes, pins and lubrication are the same in the rear as in front.

### THE BRAKES

Up to 1908 the Corbin brake drum was an interior surface 12⅜ dia. surrounding an external drum, 8¾ ins. dia., so that both brake drums were enclosed. This was changed in 1908 to the form shown in Fig. 9.

Fig. 8. Corbin [illegible] Axle Assembly. The [illegible], as to [illegible] is cast [illegible] 3-16 general thickness. The 8-spur pinion [illegible] gear [illegible] bushed [illegible] bearings, bevel gear thrust taken by a ball thrust bearing. The [illegible] front pinion annular bearing in the rear. The steel tubular fire axle [illegible] by boring and turning, shrinking and riveting. This axle perches are of the [illegible] iron forgings.

THE CORBIN MUFFLER

This is an original design, very light and inexpensive, with no back pressure whatever. See Fig. 10. The outer shell is 26 ins. long x 5 ins. dia., with two annular bulkheads. The central "tube" to which the exhaust is delivered is of heavy

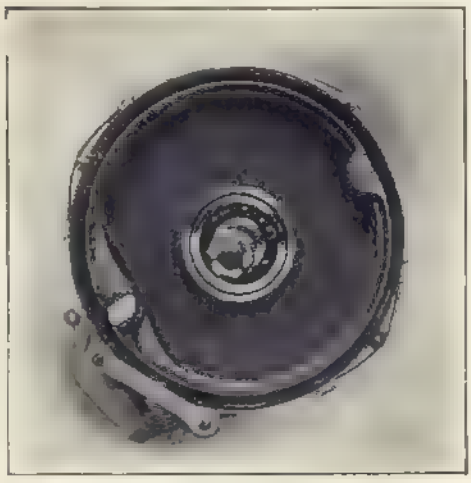


Fig. 9. Corbin 1909 Brake Construction. The brake [illegible] dia. inside, 12¾ ins. dia. outside, ¾ [illegible] face, 2 ins. outside face. The inside, cam rocker [illegible] is a manganese bronze ring, with one collet [illegible] to end of the shoe, metal to metal contact with the pressed steel brake drum, bored and turned [illegible] brake band, 70 carbon steel 2 ins. wide x [illegible] operated by a crank arm, ½ in. radius, to [illegible] rocker arm, floating on [illegible] to come to the [illegible] when the brake band has a flexible coupling [illegible] which insures clearance when idle.

wire gauze, meshes ¼ in. sq. rolled up to 2⅜ out. dia. x 26 ins. long, and having two internal flanged heads of thin sheet iron, fixed inside this roll of heavy gauze by 4 copper rivets in each bulkhead. This assembly, with the co-acting annular and entire bulkheads in the outer and inner members respectively causes the exhaust to move outward and inward in its course from entrance to exit, thus obtaining the full cooling effect of the outer shell surface, and producing an efficient silencer. The cut-out is a bronze sleeve on the cylindrical forward extension of the front head, 2⅝ out. dia., which is finished. The cut-out port is rectangular, 3 ins. long x ¾ ins. wide, and is very noisy, making a sharp and efficient warning without the use of the horn. The illustration fully shows the muffler construction. The heads are of gray iron, and the total weight is about 16 lbs., cut-out sleeve included. The construction of the heads and the escape nozzle form are also shown.

CONTROL

The common long control rocker, supported in the chassis frame sides, is replaced in the 1909 Corbin chassis by two short rockers, the forward one in the middle and carrying the down-hanging clutch disengaging arms with annular ball bearings which impinge the integral clutch cone shaft flange. This forward clutch rocker is linked to the short pedal rock-shaft at the right.

The spark and throttle control levers are ratchet stationary sector retained on top of the steering wheel, which is 17 ins. for runabouts and 15 ins. for touring cars. The steering action is a hard steel worm, engaging a hard steel worm gear sector.

There are two hand levers, the outside one, latched, pulled backward to first disengage the clutch and then apply the internal emergency brake shoes. The inside hand lever, in two slots, is fixed to the horizontally sliding selective gear shift rocker, selection linkage enclosed in the gear box. There are two large pedals on the pedal rocker, the pedal pieces being gray iron. The left pedal is pushed forward to disengage the clutch. The right is pushed forward to apply the exterior fibre-faced brake band.

The horizontal accelerator pedal is placed between the two large pedals. The muffler cut-out is worked by a heel-operated plunger.

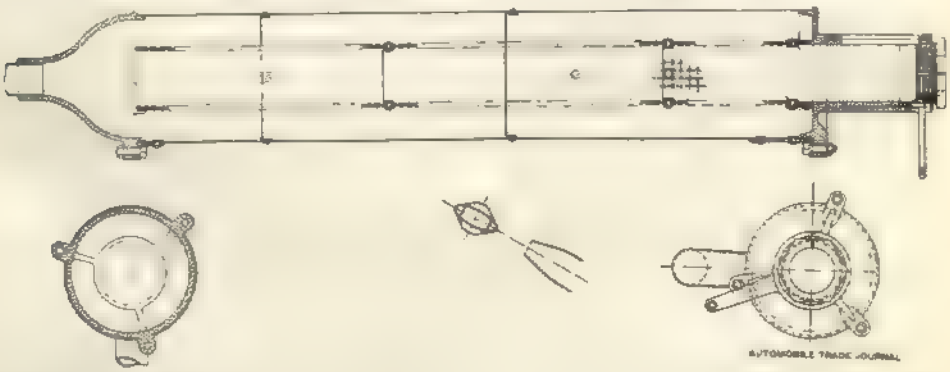



Fig. 10. Section of Corbin 1909 Muffler. The inner tube into which the exhaust enters is made of a wire screen as described in the text.

ON THE ROAD

The Corbin 1909 five-passenger touring car can do 55 miles easily, and it was intended to make a Hartford-Bridgeport

round trip; 120 miles measured fuel run for this story, but unexpected events occurred which made it inexpedient to carry out this intention in full, and the run timed was only from Hartford to Bridgeport, 60 miles, Monday, November 30, 1908.

The 5-passenger Corbin left the Asylum Street viaduct, Hartford, at 11 A. M., Joseph Matson, driver, with the writer, in the front seat, and was driven fast about half-way to New Britain, 10 miles, when the right front tire blew out, and the remaining five miles to the Corbin Garage New Britain, was made slowly. The tire was replaced, and with a third passenger the car was driven from New Britain through Meriden and New Haven to Bridgeport. The remainder of the sixty miles, in 100⅛ minutes, total running time, notwithstanding the slow five miles after the blow-out and a slow-down outside of North Haven, where a long stretch of new road is in process of construction.

The car ran perfectly in every particular, and is very easy riding both in front and in the tonneau.

The Corbin 1909 motor is silent and powerful enough to give all speed desirable, and the writer was anticipating much less than 100 minutes running time for the 60 miles from Bridgeport to Hartford when the return trip was cut short by a dash into a load of freshly dumped sand where the new road was making. The fresh sand was soft and splashed out on each side like water as our front axle struck the pile, with no injury to the car, but the sand splash had, unsuspectedly, opened the lever drain-cock of the forward splash pit so that all the oil ran out before we knew it, and forced a stop by lack of lubrication.

These lever drain-cocks are replaced by drain-screws in the Corbin 1909 motors, making accidental splash-pool drainage impossible.

Circumstances did not permit a second 120-mile run, so that, greatly to the regret of all concerned, this Corbin "On the Road" story is not as intended.

The Corbin touring car averages 15 to 20 miles to the gallon of gasoline, and the light car-weight and quick motor-response go towards fuel saving.

## MOGUL BEARING METALS

Mogul Metal Co., 149-151 Larned street, West, Detroit, Mich., manufacture a number of grades of babbitt metal which have proved very satisfactory in automobile engines. Their No 403 special nickel babbitt is very hard and tough with practically no shrinkage. No. 407 special nickel babbitt is not quite so hard, but has as little shrinkage.

Mogul bearing metal is used more especially in large stationary gas engines, but has also been successfully used by a number of prominent manufacturers of automobile engines. Some of them have used Mogul metal in all of the engines

A Mogul Die Cast Bearing.

they have manufactured for the past four or five years. Mogul metal is not as tough as the first two mentioned, and if used in automobile bearings the lining should not be too light.

Mogul white brass is a very high grade bearing metal, extremely tough and with good anti-frictional qualities.

In addition to the manufacture of babbitt metals they are also equipped with special machines of their own design for making finished pressure die cast bearings from all grades of babbitt metal. They claim to be the only manufacturers of babbitt metal who make their own die castings, and as the success of die cast bearings depends largely upon the treatment of the metal as well as the mechanical process of casting, their die castings have especial merit.

Where a large number of one size bearings are used this die casting process results in a great saving in cost to the manufacturer of engines as compared with the expense of machining them. These bearings are also perfectly accurate and absolutely interchangeable.

## ACHESON GRAPHITE GREASES

The International Acheson Graphite Company, of Niagara Falls, N. Y., is making a line of Graphited Greases, in the production of which they blend very soft, pure, amorphous, unctuous Acheson-Graphite with a high grade grease, the product containing no friction-creating impurities, as it is guaranteed at least 99 per cent. pure. Acheson-Graphite is a true lubricant in itself, the grease simply acting as a carrier. Acheson-Graphite, Grade "1340," is especially recommended.

Barnett Drop Forging Co., Easthampton, Mass., are prepared to drop forge crankshafts up to 150 lbs. weight, connecting rods of all sizes, one-piece front and rear axles, and any light or heavy forging desired. They are making a specialty of automobile work and have turned out some beautiful work of which they are naturally very proud. A recently installed 5,000 lb. hammer gives them a greater range of facilities and they are able to meet any needs of this trade. They invite correspondence and will be pleased to quote prices on receipt of blue prints. All inquiries will be given prompt attention.

All precedents, where the extent of the range of models to be shown by a single manufacturer is concerned, are to be broken by the George N. Pierce Company, Buffalo, N. Y., in the listing of no less than thirty five distinct models. As a foundation, these numerous types have no less than five separate chassis of which three are entirely new models, the lines and specifications of which have been worked out by Designer Fergusson during the past year. It takes but a glance at them to note that the trend toward the six-cylinder type will be more strongly reflected in the Pierce line than ever, as there are three six-cylinder chassis listed, two of them being wholly new creations embodying numerous new features, while the third is the 60-horsepower Great Arrow that has done so much to uphold the title of the Pierce in endurance contests for the past two or three seasons. The other new model is a four-cylinder town car of attractive lines and rated at 24-horsepower, but the efforts of the entire plant were concentrated on this and the other four-cylinder car, which is the 40-horsepower Pierce Arrow of 1908 with a few minor changes, for some time, with the result that practically the entire series of both these models will have left the works on or before the first of the year. According to Colonel Clifton, who is an enthusiastic six-cylinder advocate, it is quite probable that these may be the last four-cylinder cars to be constructed in the Buffalo factory.

To put it briefly, the Pierce line as it stands at present may be summarized as follows: the 4-24 and 4-40 in the four-cylinder class, and the 6-36, 6-48 and 6-60 in the six-cylinder class. Of these, the 4-24, the 6-36 and the 6-48 represent the new additions for the present season's selling, while the 40 and 60 horse-power, four and six cylinder types, are the 1908 line, the six cylinder member of which is to be continued. The power ratings of these cars are conservative in every instance and are based on the following cylinder dimensions. The 4-24 has a 3 15-16 inch bore by a 4¾-inch stroke, the same cylinders being employed on the 6-36, while the 4-40 is the same as last year, namely, 5 by 5½ inches the cylinders of the 6-48 measuring 4½ by 4¾ inches, while the same cylinders as the 4-40 are used to form this essential of the power-plant of the 6-60.

### DETAILS OF THE NEW MOTORS.

A departure is to be noticed from previous Pierce standards in that twin castings are now employed as the foundation of the motors on the new models, this permitting considerable shortening the total length of the motor. The position of the valves in oppositely placed outboard ports has been retained, however, as have numerous other features that have characterized Pierce design for some years. Roller ends have been adopted for the push rods where they contact with the cams, while their upper extremities have been provided with inserted fibre blocks against which the valve stem rests when lifting, thus reducing the noise from this part of the motor to a minimum. One feature of the motor's construction that may be regarded as a typical example of the extent to which refinement is carried in the Pierce factory to insure the greatest degree of satisfaction in the hands of the user, is to be found in the valve port covers. In place of the usual screw cap, there is used a plain circular plug carrying a combination asbestos-copper gasket on the under face of a shoulder on it. This plug is dropped into the lower valve port opening, directly over the valve, while a second plug, which

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is threaded, turns very easily into the opening above tapped to receive it. Through a substantial boss cast in it for the purpose, this cap carries a good-sized set screw, and when the cap is home this set screw is turned down on the loose plug beneath, effectively placing both under tension and making an absolutely gas-

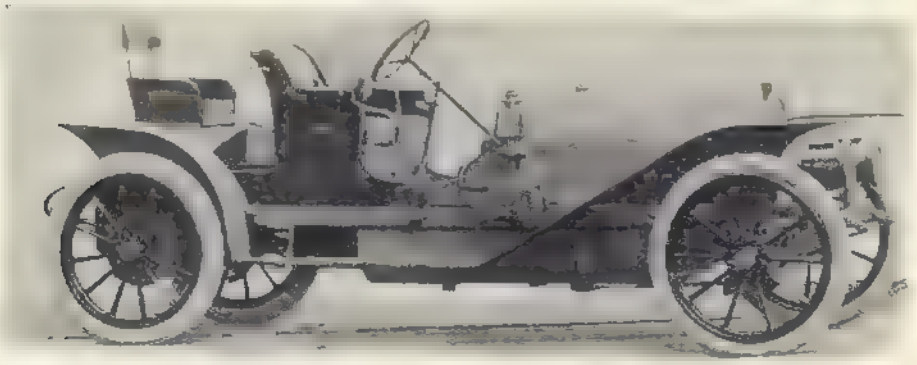


Fig. 1. Pierce Arrow 6-36 Runabout. A new 1909 model, 118 inch wheel base, 34x4 and 4½ inch tires 6-cylinder motor selective sliding gear change speed, gear shift levers at the side—a departure from previous Pierce practice. The cylinder bore is 3 15-16 inches by 4 3-4 inches stroke cylinders cast in pairs—another departure from previous Pierce designs.

tight joint that is, at the same time, very easy to open, as once the set screw is released by giving it half a turn, both the caps may be taken out without the use of any tools. The valves themselves are made with cast-iron heads, screwed, riveted and brazed on to the steel stems, and they seat at an angle of 45 degrees. The

manifold of a single piece, or of the same diameter throughout, it is provided with slip joints between each pair of cylinders in order to prevent the unequal relative expansion of the manifold and the cylinders from distorting the latter, and it is also enlarged toward the rear of the motor. Beside this, its interior is so ar-

ranged that the gases issuing from each successive pair of cylinders strike the centre of the flow coming from the cylinders ahead of them, thus setting up an injector action which creates a partial vacuum tending to greatly improve the scavenging of the cylinders. Tests made at the Pierce plant show the increased efficiency of a

Fig. 2. Pierce Arrow 6-48. A new model with landaulet body, for 1909 6-cylinder motor, 4½ x4 3-4 inches, sliding gear change speed—four speeds ahead direct on third, selectively operated 130 inch wheel base, Goodrich tires 36x4 on front 36x5 on rear, cast aluminum body special oiling system and other Pierce features are continued.

practice of pinning the cams to the shafts is still followed; the push rods work in renewable bronze guides.

While on the subject of valves, it may be mentioned that an entirely new type of exhaust manifold has been adopted on the Pierce, experiment having conclusively demonstrated that this apparently unimportant part is capable of considerable improvement. Instead of making the motor thus equipped to be fully 5 per cent. greater than when run with a perfectly free exhaust, discharging directly into the atmosphere.

The crank-shaft is a one-piece drop forging of nickel steel, specially heat-treated and showing a tensile strength of 110,000 pounds to the square inch. It is supported on seven bearings of the bronze-bushed type, and both the crank pins and main

journals are of liberal length and diameter to insure cool running and long life to the bearings. Connecting rods are of the marine type, drop-forged in one piece, and are provided with phosphor bronze bushes at both ends, the wrist pin bearing being made extra long, while provision for adjustment is allowed at the big end. The timing gears are located outside of the crank case proper at the forward end of the motor, and are protected by a special oil-tight housing. This case is also made to carry the pinions for the special side shafts driving the magneto and pumps, together with their bearings, so that when this forward housing is removed, these pinions go with it.

Aluminum alloy is employed for the crank case, all the bearings depending entirely for their support on the upper half of the casing, or engine bed, the lower part thus serving merely as an oil well. But a departure is to be noticed in that aluminum is not employed as the motor support, two drop-forged members of steel to which the motor bed is attached by four substantial through bolts being employed instead, these transverse pieces being attached directly to the side members of the frame in the usual manner. The pistons are made very light and have webs cast on the inside. The wrist pins are of steel, case-hardened and ground, and are held in place by means of taper set screws. As is the case with the cylinders, crank pins, journals and the like, the pistons are accurately finished by grinding.

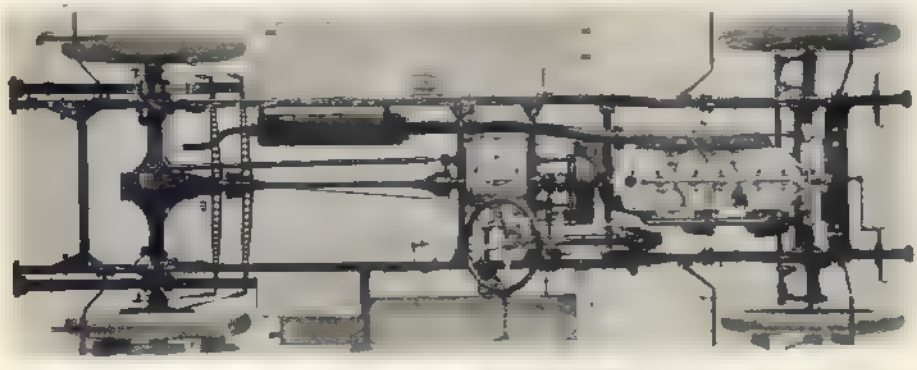


Fig. 3. Plan of the chassis of the 6-48 car, a new model for 1911, showing the arrangement of the engine in the frame, suspension not from integral crank case arms but on special pressed steel cross members at the front and rear [illegible] gear control of the change gears is used instead of the progressive change gear [illegible] where [illegible] the spring leaves being without a center bolt hole and prevented from [illegible] by the [illegible] shaped depressions made in the leaves before hardening. Note the large brake [illegible] the protected position of the cross rod of the steering gear which is placed to the rear of the front axle and raised so that it cannot be struck by road obstacles.

THE LUBRICATING SYSTEM

One of the strongest points of Pierce design has always been the simplicity and reliability of the lubricating system, than which few things are of more vital importance to the life of the motor. This may be briefly described as a constant circulating system by means of which every moving part of the motor is kept continually flooded with oil, any excess being prevented from reaching the combustion chamber by means of baffle plates, through which the connecting rods pass. The system depends for its working upon gravity and centrifugal force, the oil being raised from the crank case well by means of a gear pump driven from a special shaft, to the oil reservoir located at the height of the cylinder heads, and close to them, thus insuring a uniform temperature for the oil supply, regardless of weather conditions. From this tank no less than seven leads are taken, one for each of the main bearings, while an additional blind lead is taken to the dash where it terminates in a sight glass indicating the extent and condition of the oil supply.

The oil has to pass through two sets of gauze screens before finding its way into the tank, thus cleaning it thoroughly every time it is circulated. The tubes forming the oil outlets to the various bearings are made with recessed ends adapted to take fibre washers drilled with various sized holes, so that the oil feed may be varied in this manner if necessary, though the makers have never found any occasion to depart from the standard adopted some time since, which calls for a washer with a one-sixteenth inch outlet. Upon arriving at the bearing, the oil is lead into the drilled crank-shaft and by means of centrifugal force is thrown out on the surfaces of the big end bearings through drilled channels. The surplus drops into the oil pan, where it is utilized through the medium of the splashing of the rods to lubricate the piston and wrist-pin bearing, recesses being drilled in the top of the latter to catch some of the oil that finds its way up into the interior of the piston, and practice has demonstrated this to be more than is required, though oil is also taken in through the opening of the hollow wrist pin from the cylinder walls. This system has now been a feature of the Pierce motor for six years past. The

oil gauge on the dash may be illuminated at night by pressing an electric button.

The shape of the oil tank is such that, regardless of the position of the car owing to the grade, the feed continues uniform, and as the outlets are all of large bore copper tubing and removable wire gauze meshes are provided at every point clogging is effectively guarded against.

IGNITION SYSTEM AND ACCESSORIES.

A Bosch high-tension magneto constitutes the service side of the ignition system. It is driven from a special shaft on the right side of the motor and is connected to a set of plugs tapped into the cylinders horizontally so as to cause the spark to occur directly in the path of the incoming charge. As an emergency or secondary system to fall back on, a set of accumulators and a four-unit Autocoil outfit is provided, the timer, of the roller type being mounted vertically at the upper end of a shaft placed between the fifth and sixth cylinders in accessible position Drive is from the inlet cam-shaft through bevel gears. The spark plugs for this system are placed in the cylinder heads and as close to the inlet valves as possible.

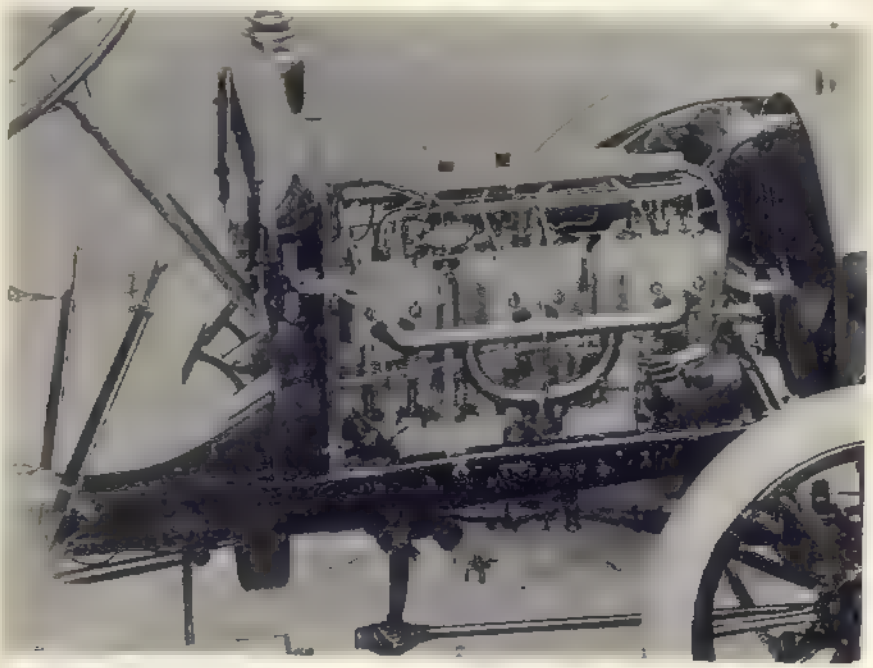


Fig. 6. A 1909 six-cylinder motor in place in the chassis, showing the twin cylinder castings, location of the timer at the upper end of a vertical housing, location of the spark plugs in the sides of the cylinders and the mounting of the magneto on the right. A cowled dash is fitted, which protects the coil. The new arrangement of gear shift levers for Pierce models is shown.

Special interest attaches to the Pierce carburetor for 1909, as it has undergone changes of a nature not hitherto attempted in this country. These relate more particularly to the manner of admitting the auxiliary supply of air and have been adopted with a view to overcoming the inertia effect present in either the diaphragm or piston type of valve. For this purpose, a cylindrical chamber placed to one side of the rotary throttle is employed In its sides are three vertical rectangular openings in the case of the larger six-cylinder motor, and two on the smaller. These ports extend practically for the entire height of the chamber in question and are closed from the interior by means of reeds attached at their upper ends. Back of these reeds are supplementary springs which serve as gradual stops of increasing tension, coming into action progressively as the motor speed and the suction increase, thus insuring an extremely gradual and regular action. The constant level chamber is placed concentric with the spray nozzle, feed being by gravity, and a coil spring is placed round the float valve spindle in order to prevent jumping or chattering owing to road inequalities The mixing chamber proper, in which the rotary throttle is located, is now water jacketed, and provision is made for taking a supply of hot or cold air as the circumstances may demand, the intake being equipped with a gauze screen to exclude the copious quantities of road dust and other foreign material, which when scraped from the piston heads and combustion chambers is indiscriminately labeled "carbon deposits" and ascribed to an excessive supply of oil

A centrifugal pump of ample dimensions attached directly to the crank case and driven by a separate shaft on the off-side of the motor, serves to circulate the cool-

ing water supply to the honeycomb radiator, and, with its aid, the belt-driven fan supported on a bracket providing an eccentric adjustment, completes the motor accessories.

TRANSMISSION

All Pierce cars for the present season mark a radical departure from previously accepted standards where this essential is concerned, as a four-speed selective type of gear-set has been adopted in place of the progressive three-speed box with control from the steering column that so long held its own as a distinctive feature of Pierce design. The leather-faced cone clutch provided with a liberal amount of cork inserts is continued without change, and the spring being of the self-contained type, thus avoiding all thrust when in engagement. A special ball bearing is provided to take this thrust when the clutch is disengaged. Directly back of the clutch it having been found that much better results are obtainable by making and hardening the gears separately, as it is impossible to prevent more or less distortion where the gears and shaft are made in one piece. Four speeds and the usual reverse are provided, the ratios, i. e. of the gear-set alone being 3.54 to 1 on the low, or first, 2 to 1, on the second, and 1 to .75 on the third, while on the reverse it is 4.56 to 1. Specially heat treated chrome nickel steel is employed for both the gears and the shafts. Direct drive is on the fourth speed which is brought into engagement by means of a usual type jaw clutch

THE CONTROL LEVERS.

Control follows more or less conventional lines in the shape of the H-sector and single side lever, the gear shifting bars being retained by means of the usual ball and spring, but the interlocking de-

Fig 5. Exhaust side of 6-cylinder Pierce 1909 motors showing the location of the oil tank above the exhaust pipe, where it is kept warm, and the seven leads to the various parts including a blind lead to a sight feed glass on the dash. The muffler is arranged on the ejector principle so that it is claimed the motor shows greater efficiency with this muffler pipe than with exhausting into the air. The 4-cylinder models have cylinder dimensions from 15-16 inches bore, 4½ inches up to 5 inches. In each case the stroke is longer than the bore.

is a large double universal, allowing play in every direction; this has been so well worked out that the distance between the clutch and gear box is extremely short, though ample play is allowed for. In fact, no single essential of the car shows so strikingly the high factor of safety entering into the design as does the transmission. This applies particularly to the Hess-Bright ball bearings on which the shafts are mounted, as Designer Fergusson exceeded even the manufacturer's specifications where the size of the bearings necessary was concerned.

The fixed gears are securely bolted to flanges made integral with the lay-shaft, vice as well as a special safety lock when the gears are in neutral have been well worked out. This takes the form of a quadrant with holes drilled at appropriate intervals to permit a pin to drop into them, thus preventing any attempt to mesh one gear while another is engaged, while a stop effectively prevents the clutch being engaged before the gears are in proper mesh, and in a similar manner the operating lever is locked in the neutral position and the clutch is held partly out of engagement. This provides an excellent safeguard against disaster in case the driver has left the car with the motor running and the ubiquitous small boy be-

gins to play with the levers, as is so often the case. In order to take the hand lever out of neutral, it is first necessary to disengage the clutch entirely and this cannot well be done except by getting into the driver's seat.

THE REAR AXLE ASSEMBLY

Directly back of the gear set is a large universal of the cross-pin type, while at the other end of the propeller shaft is a

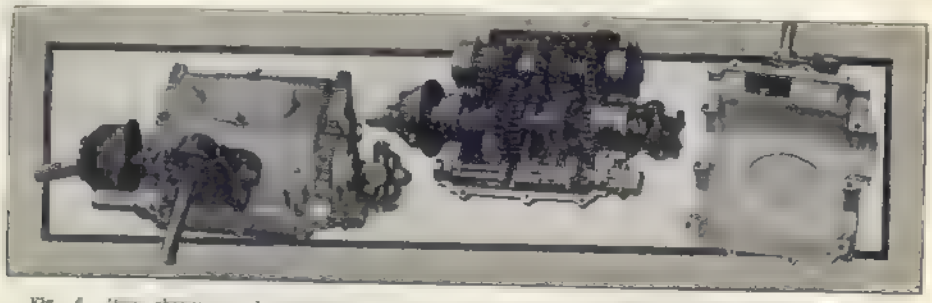


Fig. 4 [illegible] change speed mechanism of Pierce Arrow cars. For this year a four speed selective operated change speed mechanism is used, mounted on annular ball bearings of extra large size. The progressive control lever under the wheel has been superseded by the selective gear shift lever operated in a conventional H grid at the side.

combined universal and telescopic joint, thus permitting of longitudinal movement of the shaft itself when the springs are depressed to a point that renders this necessary. A spur type of differential is employed, three pairs of pinions being used. They are housed together with the driving gear in a cast steel casing forming the centre of the rear axle support. But while a live axle is employed it is of the fixed type being rigidly fastened at its ends directly to the wheels. The shafts are of heat-treated chrome nickel steel and taper toward their outer ends, the increase in section being fully 25 per cent. The wheels are attached directly to the axles by means of Woodruff keys. Annular ball bearings are used throughout, the thrust of the large bevel being taken on an independent bearing, so that it is impossible for the bevel gears to be drawn out of mesh by wear on the driving axle bearings.

The brakes are centered in large steel drums attached to the rear wheels, the service brakes consisting of the internal expanding set, which are interconnected with the clutch, while the emergency brakes comprise the external contracting pair which operate independently, thus permitting the motor to be used as a brake. The shoes of both sets of brakes are pivoted at their lower ends and are lined with Raybestos, operation being by means of a toggle action. An extremely liberal amount of braking surface has been provided and each set of brakes is equalized by means of an evener the full width of the frame.

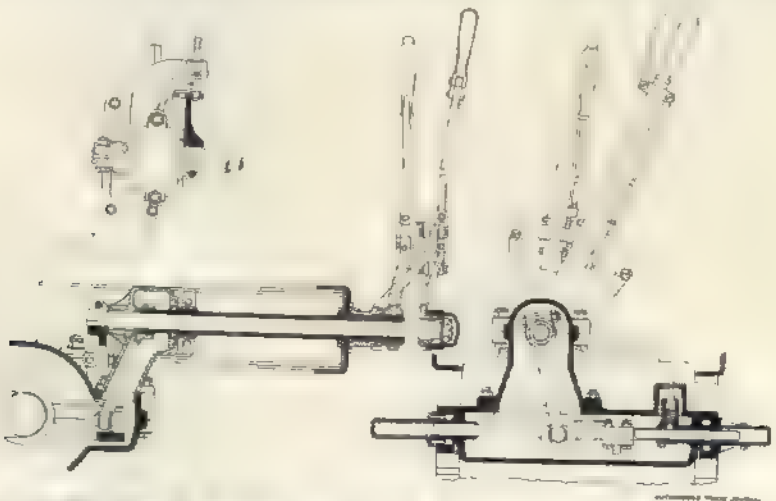
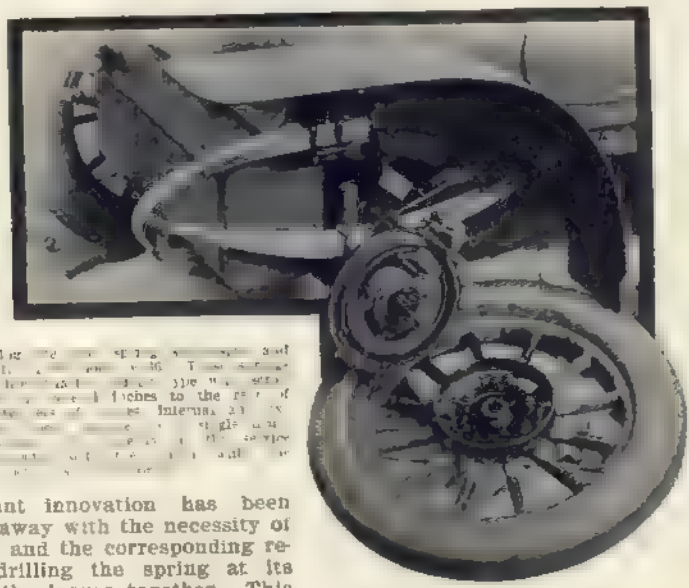


Fig. 5. A sectional drawing of the Pierce Arrow 1909 gear shift bar and quadrant. This lever is of the conventional selective type, as shown.

SPRINGS.

Standard channel section pressed steel frames are employed in all the models, but in the 4-24 and 6-36 these are of the drop type in the rear to permit of a three-quarter elliptic spring being used for suspension at that point, the forward springs being of the flat semi-elliptic type on all the models, while springs of the latter class are also used all round on the 6-48, the 6-60 and the 4-40 models. The front

axles for all are onepiece drop forgings of a simplified type in that the steering yokes are made integral with the front wheel spindles instead of with the axle as is customary, while the axle itself is in the shape of an inverted arch of large radius, thus avoiding the sharp bends necessary to make the usual drop required to clear the crank-case. The steering knuckles and spindles are nickel steel drop-forgings, held to the axle by means of a large tapered nickel steel pin which is retained in its place in the axle end by a set screw. In connection with the suspension just mentioned, an apparently slight



though important innovation has been made by doing away with the necessity of a retaining bolt and the corresponding requirement of drilling the spring at its centre to hold the leaves together. This has been accomplished by punching up a boss at the centre of the spring leaf when soft, this raised portion dropping into the recess caused by the formation of the boss in the leaf below, thus locking the assembly of spring leaves against longitudinal movement. The necessity for drilling the spring leaves at this point for this purpose has always tended to greatly weaken the spring besides considerably shortening its life as the majority of spring breakages were found to occur there, so that the improvement is of more importance than would appear at first sight.

The steering gear is of the nut and screw type, the nut being attached to trunnions carrying die blocks sliding in the jaws of a forked lever which serves to communicate the motion to the steering rod. The cross rod is placed behind the axle to prevent damage to it through meeting an obstruction. These rods are made of nickel steel tubing and are fitted with spring controlled ball joints that automatically compensate for any lost motion occasioned by wear. The throttle and spark control levers are mounted just below the steering wheel and back of it, making easily accessible without removing the hands from the wheel.

Wheel bases of the different models range from 112 inches in the 4-24, which is the shortest, to 135 inches on the 6-60, the intermediate steps being 119 inches for the 6-36, 124 inches for the 4-40, and 130 inches for the 6-48. Goodrich tires form the standard equipment, the sizes employed being as follows: 36 by 4½, and 5½ inches on the 6-60; 36 by 4 and 5-inch on the 6-48, this also applying to the 4-40; 34 by 4 and 4½ on the 6-38, and 34 by 3½ and 4 on the 4-24 when fitted as touring car or roadster; when fitted as a town car with a landaulet or limousine body, the tire equipment is smaller, consisting of 32 by 3½ and 4-inch tires.

The choice of bodies will include practically every type now known to the automobile world. Cast aluminum is the material employed and the Pierce factory supplies the entire demands of its customers where body requirements are concerned from its own shops. As a further instance of the completeness of the Pierce plant and the great extent to which it turns out the various essentials entering into the car, it may be mentioned that it is one of the very few factories that operates its own wheel building shop, the stock for this purpose being purchased long in advance and specially seasoned in the open air before using

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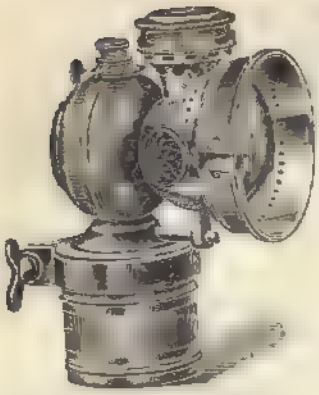
J. Elmer Pratt, who has been identified with the automobile industry since its inception in this country, has been appointed sales manager of the George N. Pierce Company of Buffalo, makers of the Pierce-Arrow cars.



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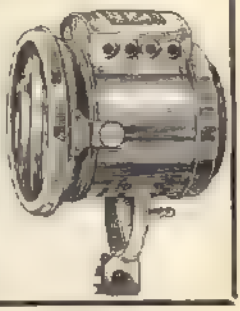

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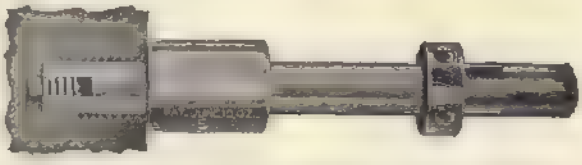

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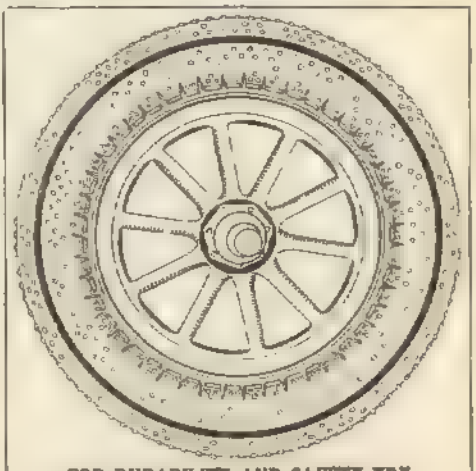

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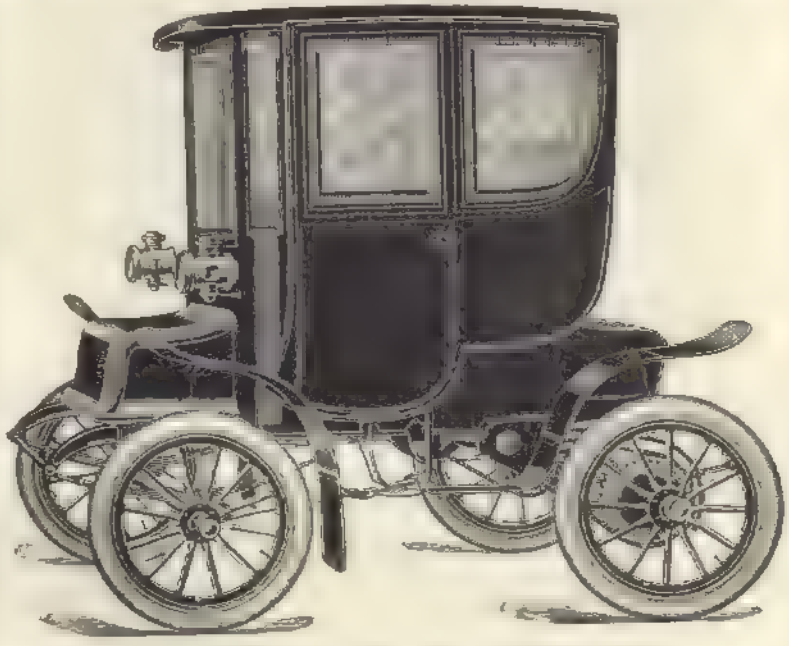

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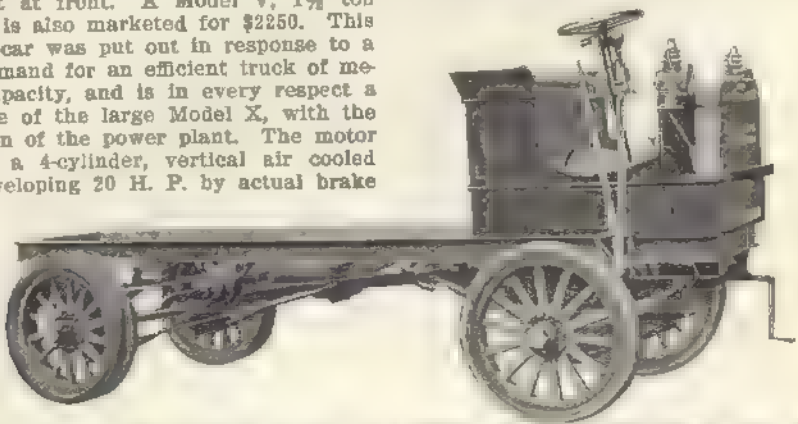
## THE GRAMM-LOGAN CARS

The Gramm-Logan Motor Car Company, Bowling Green, Ohio, U. S. A., are manufacturing a complete line of commercial vehicles, ranging in price from $1600 to $3500. These vehicles include anything from the small four-cylinder, Model Y, 20-24 H. P. car, up to the Model X three ton truck, equipped with a 40 H. P., 4-cylinder, vertical water cooled motor under the seat at front. A Model V, 1½ ton chassis, is also marketed for $2250. This smaller car was put out in response to a wide demand for an efficient truck of medium capacity, and is in every respect a duplicate of the large Model X, with the exception of the power plant. The motor used is a 4-cylinder, vertical air cooled one, developing 20 H. P. by actual brake



Gramm-Logan Model X [illegible] 4 wheeler, 4¾ in. x5-in. water cooled motor rated at [illegible] three speed [illegible] gear change [illegible] Weight of [illegible] 20 in. Tires [illegible] Price [illegible]

test. It is said this engine was given an extensive test before it was adopted, and was found to be perfectly satisfactory for the work. Either ball or roller bearings are used on all shafts, in the gear case and in the road wheels, and even in the fan bearing.

### MODEL X.

As the general arrangement of the cars are similar, a brief description of the Model X, 3-ton machine will give sufficient idea of the other models. Fig. 1 shows a side view of the Model X chassis. This machine has a wheel base of 120-in., and a length over all of 182 inches. The load length is 11 feet behind the driver's seat. The tread is 60-in. The car will average approximately 5000 pounds in weight, and has a carrying capacity of 3 tons pay load. The machines are geared according to requirements of the service in which they are to be used.

### THE MOTOR

This company has experimented with electricity, steam and gasoline as motive power, and has definitely decided on gasoline. The two-cycle-four-cycle question has also been investigated by them, and a four-cylinder, four-cycle, water cooled motor decided upon. That is for the large truck, although the smaller V and Y use an air cooled motor. The Model X truck motor has twin cylinders 4¾x5-in., developing 40 H. P. on the brake. The cylinders are offset from the crank shaft 1-in. with the attendant advantages, such as more direct application to turning moment of the force of the explosion, the practical elimination of the dead center, and the reduction of side thrust on the cylinder walls. The cylinders have integral heads and water jacks and valve chambers, and are cast from reverberatory air furnace iron and not the usual cupola iron. The cylinders are accurately bored and reamed in a special machine and then ground to exact size, and tested under hydraulic pressure, both before and after machining. The pistons are of extra length and are made from the same quality of iron as the cylinders. They are also finished by grinding and carry four expansion rings with lapped joints. These rings are re-turned and ground on the sides and bearing surfaces after being cut. Five oil grooves are also turned in the side of the piston for distributing the oil from the splash, and thus lubricating the cylinder walls.

### LUBRICATION AND WATER CIRCULATION

The lubrication is by a self-contained force feed oil system. A reservoir of about 3 gallons capacity is cast integrally with the lower part of the crank case oil pan, and the oil is pumped from this source of supply to all the bearings by means of a small gear pump, which is located in the reservoir, and driven by gears from the lower end of a vertical timer shaft. The surplus oil from the bearings passes, by means of an overflow pipe through the strainer back into the reservoir, after providing an oil level in the case for the splash. A bull's eye oil gauge at the front of the reservoir indicates the oil level. The water circulation is maintained by a centrifugal pump, gear driven. The water piping is all of seamless copper tubing. The radiator, which is mounted on the front of the frame, is assisted in its action by a belt driven fan, and has a capacity of 25 gallons.

This engine is mounted at the forward

end of the chassis on the special subframe of angle steel, the forward end of which is securely riveted to the front cross member of the main frame, which is made of 5-in. rolled channel. The rear end of the subframe rests on a cross member of angle section. This main frame is made in two pieces, bent and riveted at the center of the ends. Jump spark ignition dual type, using a magneto and dry batteries is fitted. The multiple disc clutch, which runs in oil, and is completely encased, transmits the power through a shaft fitted wih universal joints to a three speed and reverse sliding gear, which is a mechanism which is mounted with the jack shaft at about the middle of the frame. The final drive is by side chains of 1½-in. pitch, ¾-in. width to the rear wheels. The shaft connecting the clutch with the change speed gears is of chrome nickel steel and fitted with two universal joints, one being a slip joint. The change gear shafts are mounted on Timken roller bearings, the gears being of Krupp's chrome nickel steel. The standard gear ratio is 9 to 1 on the high, but can be varied to suit special conditions

These trucks are also equipped with two side oil lamps and also tail lamp, and a complete set of tools. The chassis is complete in itself, and bodies may be attached or detached without interfering in any way with the mechanism of the car. Bodies of various types and excellence can be supplied to suit purchasers. All parts are claimed to be absolutely interchangeable. This large truck of 3 tons capacity sells for $3500 without body.

THE MODEL Y.

The motor of both Model V and Model Y is a 20 H. P., 4-cylinder, air cooled one, which it is claimed remains cooled under any and all conditions, and is also very quiet. The cylinders are cast separately with integral flanges, and the valves are of the overhead type, operated by vertical rods and rocker arms. The crank case is made of special aluminum alloy with internal ribs giving maximum strength and minimum weight. Crank shafts are drop forgings of special steel, hardened and ground to size and are also carefully balanced. The bearings are Parson's white brass and carefully hand scraped. Four eccentric rings with diagonal cuts are

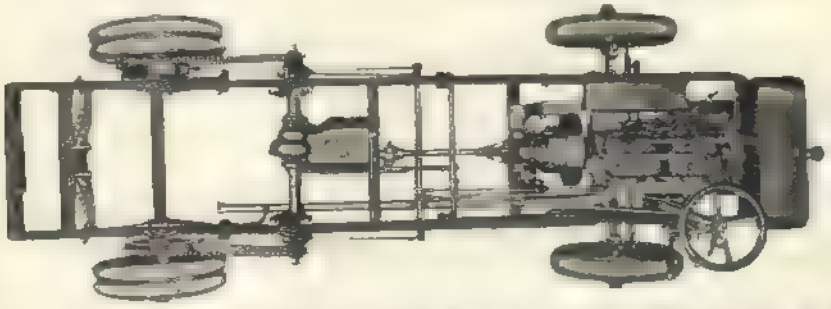


Fig. 2. Plan view of the 3-ton Gramm-Logan Model X, showing the large radiator mounted at the front [illegible] is side chains on a special subframe. The enclosed multiple disc clutch, propeller shaft with two universal joints and slip joint. The [illegible] speed gear differential and counter shaft and the side chain drive. Solid tires are used at front and rear on pressed steel wheels. Front tires are 36x5-in. and 36x [illegible]. Twin tires are used on the rear. Timken roller bearings are used in the wheels and also in the steering knuckles.

There are two sets of brakes, one set of running brakes on the jack shaft, operated by foot lever and emergency brakes on the rear hubs operated by the hand lever at the right of the driver's seat. Together these brakes insure complete control, and are sufficient to hold the loaded truck on any grade. The usual spark and throttle levers are provided on the steering column just below the wheel.

The springs are semi-elliptic at the front and platform at the rear and suited to the loads carried. Heavy artillery type wheels 36-in. in diameter with felloes the entire width of the rim are used. Pressed steel is the material used in the standard wheels, wood wheels are extra. 36x5-in. solid rubber tires are used on the front wheels, and 36x3½-in. twin solid tires are fitted to the rear wheels. Steering is by worm and nut, is irreversible and is built sufficiently heavy to stand severe usage.

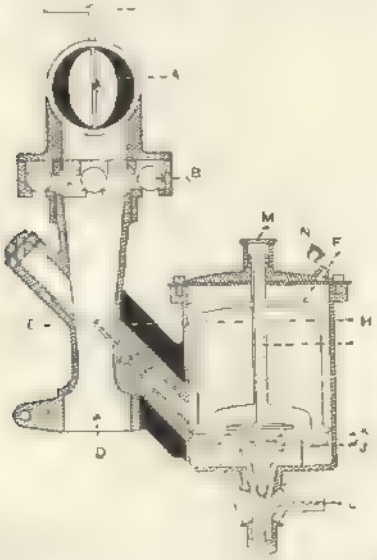
used on the pistons. These rings are finished by grinding after being cut. The timer is mounted on a vertical shaft and is driven by means of mitre gears from the cam shaft. A large fan is mounted at the front of the engine on a support from the crank case, and is so arranged that the fan belt tension is adjustable. This Model Y has a solid rear axle, is side chain driven and is fitted with 34-in. wheels. The chassis sells for $1600, and the 1½-ton sells for $2250. This model uses the same air cooled motor as the $1600 car.

A special point is made by the company of the fact that the bodies are in no way connected with the mechanism, and that any and all conditions, and is also very to suit varying conditions, also that a single chassis is frequently used in connection with several bodies. All machines are sold F. O. B., Bowling Green, Ohio.

## THE "G. & A." MOTOR CYCLE CARBURETOR

George V. Lyons Motor Co., Broadway near 87th Street, New York City, importers of the Minerva motor cycles, is now also importing the "G. & A." carburetor for motor cycles. The sectional illustration herewith gives a clear idea of its constructional lines and shows that it is designed for simplicity and accessibility.

A novel feature of this carburetor is the device employed for controlling the extra air required at high speeds. The mixture chamber above the jet carries a perforated collar, known as the auxiliary air chamber, the air holes in which are of various dimensions and are covered by metal balls of corresponding sizes. When the motor is running slowly the lightest ball only will be lifted from its seating,




Sectional view of "G. & A." carburetor for motorcycles. A, butterfly throttle; B, ball-controlling extra air inlet; C, nut covering jet; D, primary air aperture; E, float; G, needle valve; H, gasoline level; J, levers; K, weight attached to needle valve; L, gasoline inlet; M, cap closing needle valve; N, cap closing cover of float chamber.

admitting but a small quantity of air. As the speed of the motor increases other balls be lifted until the motor is running at its maximum speed, thus always providing the correct amount of air in proportion to the speed of the motor. There are no spring valves or other devices to get out of adjustment.

The orifice of the jet is placed at the narrowest part of a conical chamber placed vertically beside the float chamber. Hot air is carried in at the bottom through a funnel-shaped tube carried from the cylinder walls, and thus acquires a very high velocity as it rushes through the narrow portion past the jet, carrying the gasoline with it to the ball controlled mixing chamber above. The jet projects at an upward angle from the float chamber, and can be removed without disturbing the carburetor in any way. The throttle is placed above the mixture chamber, and is of the butterfly type

## THE "KOKOMO" MOTORCYCLE TIRE

The Kokomo Rubber Co., of Kokomo, Ind., well known as manufacturers of vehicle and bicycle tires, has lately placed on the market a motorcycle tire. This tire is moulded in regular moulds of the same

The "Kokomo" Motorcycle Tire.

pattern as are used in moulding automobile tires. A closely woven fabric is used which is especially adapted for retaining the rubber. The tire is made in single Clincher type as shown

## THE "WALTON" ADJUSTABLE MOTORCYCLE PULLEY

The Walton Motor Co., Inc., Lynbrook, Long Island, New York, has recently placed on the market the adjustable motorcycle pulley illustrated herewith.

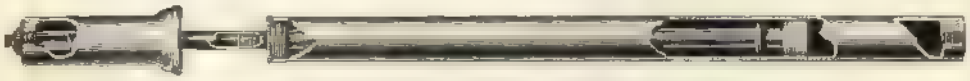
This pulley gives eight adjustments and needs no tools to alter the gear ratio, this being done by running the belt off, press-

The "Walton" Adjustable Motorcycle Pulley

ing the flange B back, and turning it around until slot of greater or lesser depth is opposite the peg C in the sleeve of the flange A. The belt keeps the peg up in the slot, thus varying the effective diameter of the pulley. This pulley is made to suit any belt driven machine. The list price is $5.

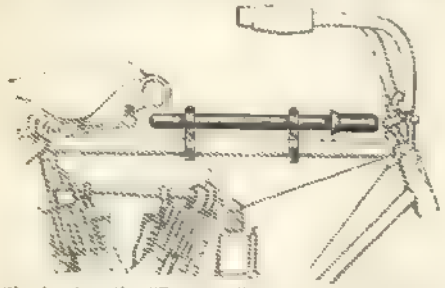
### THE "BRIDGEPORT" NO. 20 TELESCOPE MOTORCYCLE TIRE PUMP

The Bridgeport motorcycle tire pump illustrated herewith is the product of the Bridgeport Brass Co., Broadway and Murray Streets, New York City.



The "Bridgeport" No. 20 Telescope Motorcycle Tire pump

The cylinder of the pump is made of heavy seamless brass tubing, including the inner plunger tube. The handle and nipple ends are reinforced and the whole affair is heavily nickel plated. The hose

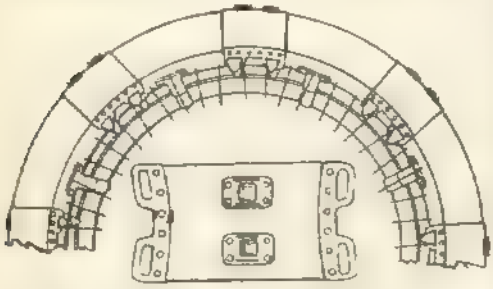


Showing how the "Bridgeport" No. 20 Telescope Motorcycle Tire Pump can be attached to the frame of a motorcycle.

connections are made to fit either American or Foreign valve sizes. The pump can be attached to the frame of the machine by means of two adjustable clips.

### THE "N. S. U." DETACHABLE NON-SKID BANDS

The accompanying cut illustrates the N. S. U. Detachable Non-Skid Band, manufactured by the N S. U. Motor Co., of 206 West 76th Street, New York City



Details of the "N. S. U." Detachable Non-Skid Band.

The outfit consists of eight pairs of hooks fastened at regular intervals to the rear wheel of a motor cycle thus becoming a permanent fixture. For each pair of hooks a leather band about 3½ in. wide is provided, which is easily placed in position if the tire is slightly deflated, then when the tire is pumped hard again it is securely held in place and will not slip or chaff the rim. The bands are provided in the center with square metal plates having rectangular projections which grip into slippery surfaces. The result is that safety on greasy or muddy roads is assured while the danger of slipping on block or stone pavement is minimized owing to the large amount of rubber surface exposed.

These non-skids need only be used in cases of emergency and are very practical for that exact reason, as they are quickly removed, and, moreover, do not interfere to any extent with the resiliency of the tire or detract from the power of the engine thus not placing an extra burden on the chain or belt as the case may be. Provided the rims and clearance space will admit it, the non-skid device can be attached to any machine and when not in use, can be detached and stowed away. A special bag or carrier is provided for those who might care to have one. The bands and studs can be replaced separately when worn.

### THE N. S. U. "EASY STARTING PLUG"

The N. S. U. Motor Co., of 206 West 76th Street, New York City, has lately placed on the market a spark plug, which is claimed to prevent all ignition troubles resulting from improper spark plug construction and to make starting easy. The plug is made in two styles, mica insulation with ½ inch nut and metric thread. Three points sparking to a platinum wound steel wire form the ignition arcs.

### WIDMAYER INCORPORATES

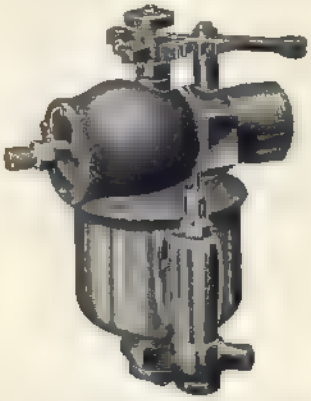
The Frank B. Widmayer Company, of 2312 Broadway, New York City, has been incorporated under the New York State Laws with a capital stock of $10,000. The company will manufacture, sell, store and repair motorcycles, bicycles, automobiles and electrical and mechanical devices of all kinds. Its officers are F. B. Widmayer, President and Treasurer; W. F. Widmayer, Jr., Vice-President, and H. C. Mapp, Secretary.

A new motorcycle club has recently been organized in Chicago. Through the efforts of Manager Fisher, of the local Indian branch, the riders of machines of that make have been organized under the name "Indian Motorcycle Club of Chicago." On Sunday, November 8, they held their first run.

At Sydney, Australia, a month ago, several local motorcycle agents and riders inaugurated a reliability and endurance contest in which a large number of motorcycle enthusiasts took part The distance was 100 miles, but so many completed the distance with perfect scores that it was decided to keep on running till a winner was produced. After going over the course 5 or 6 more times a 5 H. P. twin cylinder N. S. U. won the contest.

## HEITGER MODEL C CARBURETOR

For 1909 Heitger Carburetor Co., 203 W. South street, Indianapolis, Ind., are offering their Model C carburetor which retains all the principal features of their former models, but these are improved and new and tried features added for 1909. This model has a mechanical control over the gasoline feed so that the



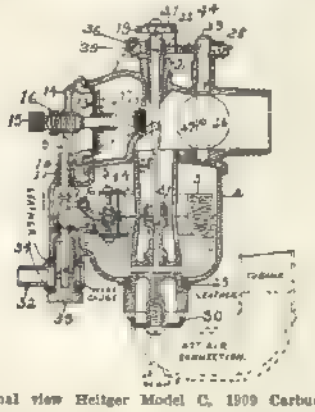
Exterior view Heitger Model C, 1909 Carburetor.

gasoline is positively fed according to throttle opening and air admission. The throttle lever has a segment of a gear (23), integral with it, meshing into a similar one (22). This segment has a long shank threaded into the nut (20). The gasoline adjusting stem (19) is threaded into the segment (22). The lower end of stem (19) is tapered to act upon the small feed hole in spray nozzle (31) and controls the feed of gasoline into the mixing chamber. The lower end of stem (19) is supported, and held centrally by the hole in the upper end of the spray nozzle. As the gear segments (22), (23) convey a rotary motion to the threaded part of segment (22) as throttle is opened or closed, this gives an up and down motion to the stem (19), thereby feeding more or less gasoline, according to throttle position, feeding the maximum when throttle is wide open, and minimum when nearly closed.

The nut (20) is split, and has a tapered head and seat, so that it can be screwed down to take up the wear or looseness in the threads on shank of gear (22). This does not alter the adjustment of the gasoline, as the threads are same pitch inside and out. The spray nozzle (31) at its top has a narrow circular or ring shaped opening, of large circumference, for the passing air to act upon, bringing the air in intimate contact with the gasoline, causing them to readily mix. This ring-shaped gasoline outlet is very narrow and deep so that as its bottom walls are wetted with gasoline it will creep to the top by capillary attraction, making a high level in the nozzle, though the level be considerably lower in the float chamber. This makes smooth running on rough roads, and easy starting by the crank.

The float is of cork, weighted by the plates (4) to permit using a rather stiff spring for closing the float valve, reducing leaking to a minimum. The float is adjusted in height by the screw (5) which is threaded into the float lever (6) and works free in supporting plates (4). Screwing to right or left raises or lowers the float, the float always lying in a straight horizontal position, when closed, whether adjusted high or low. The float is held in a central position to prevent friction by the guide pin (8) upon which float lever (6) slides.

The gasoline connection (32) is made for tubing or ⅛-inch pipe, and swivels to any position for attaching line pipe. This connection has a pocket in it to catch and retain dirt, as the screw (33) has a wire



Sectional view Heitger Model C, 1909 Carburetor

gauge strainer of large area around its circumference to catch the dirt. The joints on the gasoline connection are made tight by gaskets.

The air valve (13) is of leather, stiffened by a brass washer, and has bronze spring adjusted by the screw (15). The cup (30) is for holding a quantity of gasoline when the carburetor is flushed as in starting in cold weather. A hot air connection is furnished as shown in cut, when desired; this fits on in place of cup (30).

The motorcycle type is nickel-plated. Special types are also made for Buick and Ford runabouts.

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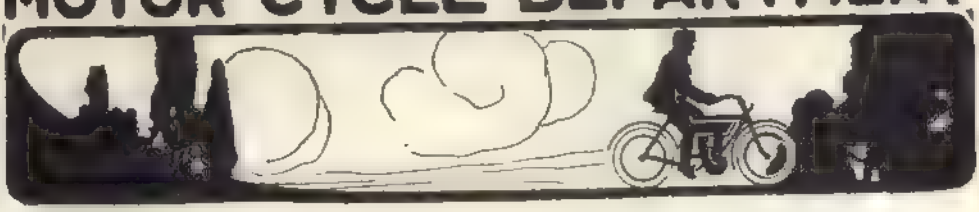
Gilbert Mfg. Co., the well-known makers of fabric specialties of New Haven, Conn., are now making a racing cap or bonnet which protects the face and head while driving at speed. This company has also added to its line a new gas tank key which is made with a bottle opener at one end. It is finished in nickel plate.

Trenton Rubber Mfg. Co., Trenton, N. J., have opened an office and salesroom at 1997 Broadway, N. Y. This has been made necessary by the rapid growth of their business especially on inner tubes and Thermoid brake lining. The latter is carried in stock in most of the large cities to insure prompt deliveries.

# MOTOR CYCLE DEPARTMENT



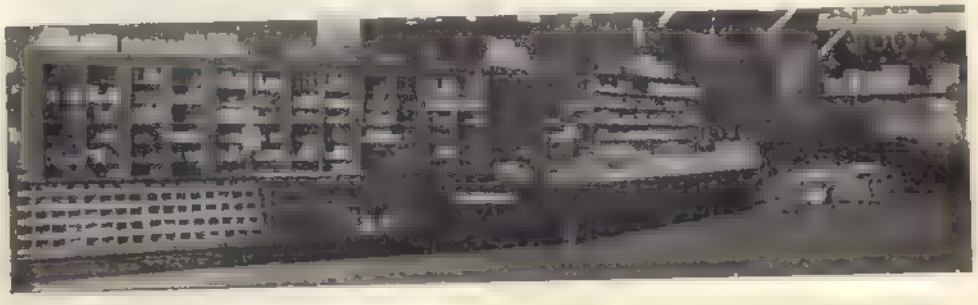
Panoramic view of one side of the salesroom of Jos. Holle. Truss roof construction gives a 50-ft. wide room without obstructing posts.

## THE HOLLE MOTOR CYCLE ESTABLISHMENT

What is claimed to be the largest retail motor cycle establishment in the country is owned and conducted by Joseph Holle and is located at 20th and Folsom Streets, San Francisco, Cal. This well planned, well equipped building has a 50 foot front and a depth of 122½ feet giving a total floor space on one floor of 6,125 square feet. The front portion of the building is allotted to the salesroom and the truss roof construction employed gives an absolutely clear floor as no supporting posts are necessary.

The repair shop is 50x35 feet and is equipped for all kinds of repairs.

Joseph Holle, more widely known in his vicinity as "Joe Holley the Bike Doctor," is a pioneer in the motor cycle field. He received his first machine—a Holley Autobike—in November, 1900. This ma-



Facade of the Holle motor cycle establishment claimed to be the largest in the country. Building is 50 x 122½ ft., giving 6125 sq. ft. of floor space.

A corner of the Holle repair shop. The drills, lathe and other machines are along the left wall and the air-compressor may be seen in the corner.

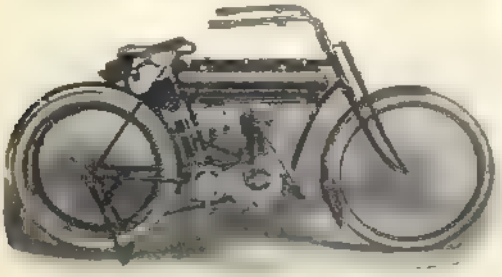
chine was made by Holley Brothers the well-known carburetor and magneto man-

Another view of the Holley repair shop. The repair shop is 50 x 35 feet.

ufacturers. He has been engaged in the bicycle business in San Francisco nearly 14 years.

## THE "YALE" 3½ H. P. MOTORCYCLE

For the season of 1909 the Consolidated Mfg. Co., of Toledo, Ohio, is offering the Yale 3½ H. P. motorcycle shown herewith All features of this machine are along lines of the best foreign practice, which together with the unsurpassed manufac



The Yale 3½ H. P. 1909 Motorcycle. Price $200.

turing facilities of this company, have been utilized to produce a reliable, consistently performing motorcycle at a reasonable price.

The motor is of the 4-cycle type; bore, 2 5-32 in. by 3 11-16 in. stroke; enclosed fly wheels weighing 31 pounds. All bearings are forged from tool-steel, hardened and ground, running in best bronze bearing metal. The valves are forged from nickel steel. An I-beam connecting rod is fitted. The cylinder piston and rings are of die cast metal. A glass oil sight feed is fitted in right side of the crank case.

Ignition is by jump spark, from dry cells. The vibrator is attached to the side of the gear case on main bearing. The contact points are iridium platinum. The battery box holds three No. 6 dry cells. The spark coil is attached to the seat mast.

A simple and economical float feed carburetor is fitted. The control is by double grip. The right grip operates the throttle and the left grip the spark and exhaust valve lift. Transmission is by a 1⅝ in special tanned, waterproof belt; the proper tension being maintained by moving the rear wheel back with chain adjusting screws and patent belt fastener. The gasoline tank holds 1½ gallons of gasoline and two quarts of lubricating oil. The oil tank is carried in a separate apartment in the gasoline tank. Oil is forced in the crank case by a pump. The frame is 1⅛ in. 16 gauge seamless tube, with extra brace. All connections made from drop forgings are strongly reinforced and the rear fork ends forged. Turned head fittings are carefully hardened. The wheel base is 53¼ in. The cushion fork absorbs all vibration from front wheel; has large springs and tension adjusted to suit rider Three inch, strongly braced mud guards are fitted. The tires are of the Clincher type, 28x2½ ins., Morgan & Wright. A Troxel Eagle motor seat is fitted. Morrow coaster brake. The machine is finished Royal blue with an option on red. The price of the machine is $200 F. O. B., Toledo, Ohio. This price includes complete set of tools in roll, and a motorcycle stand. The weight of the machine is 160 pounds.

## N. S. U. 1909 PRODUCT

The N. S. U. line of motor cycles for the 1909 season is the most complete the N. S. U. Motor Co., 206 W. 76th Street, New York City, has ever produced. There are all sizes from 1½ H. P. light weight machines to 7 H. P. twin cylinders both pleasure and racing models. The complete line of machines made by this concern will be described in the February issue of this "Journal."

Robert Stubbs, of Birmingham, Ala., recently broke the American track record for motor cycles for 100 miles in 2: 5: 5 4-5, and the world's record of 2: 2: 19, when he covered the 100 laps of the Birmingham fair ground track in 1 hr. 47 mins. and 44 secs.

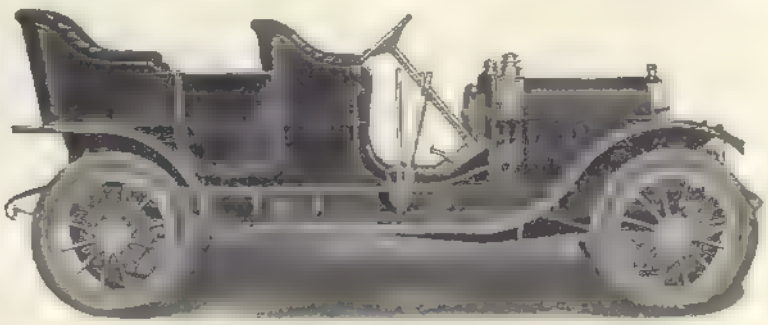
The Atlas
TWO MOTOR CARS CYCLE

# Three-Cylinder Touring Car

is equipped with the Atlas two cycle simple, Flexible Efficient, Indestructible Engine. The 3-cylinder two cycle Atlas engine has the light multiple impulses of the six-cylinder four cycle type without any of its complications or rapid deterioration The numerous poppet valves valve shafts, adjustable bearings, cams, springs and dozens of other small breakable, wearable parts are completely eliminated in the Atlas.

## The Engine is Practically Indestructible

The 1909 Touring Car has pressed steel frame 110" wheel base, geared pump, geared oiler and geared fan. Atwater Kent ignition, ¾ elliptic rear springs 34 x 4" tires, aluminum body, handsome lines, extreme ease of riding, full equipment of lamps and generator or tank; price, **$2,000.**



## The 1909 Line

| | |
|---|---|
| **2-Cylinder Runabouts** | **Town Car** |
| **3-Cylinder Runabouts** | **Taxicab** |
| **3-Cylinder Touring Cars** | **Delivery Wagon** |

**WILL EXHIBIT AT GRAND CENTRAL PALACE, DECEMBER 31st to JANUARY 7th, SPACE 9, SECTION N**

# ATLAS MOTOR CAR CO.

92 Birnie Avenue : : : : SPRINGFIELD, MASS.

NEW YORK OFFICE, 1876 BROADWAY

*SEND FOR CATALOGUE AND TWO-CYCLE CATECHISM*

## THE SAVOY CLOCK

Designed to resist jars and shocks. Elegant quick-train movement. Dial French Porcelain, measuring 2¼". Dust, rain and thief proof. Runs eight days.
Price..... $10.00

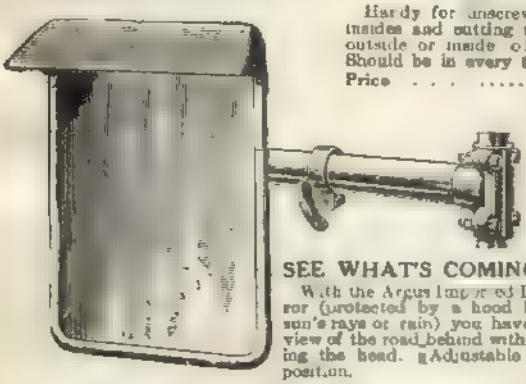
## ROYAL VALVE TAP and DIE

Handy for unscrewing valve insides and cutting threads on outside or inside of valve. Should be in every tool kit.
Price . . . . . 25 cents

## THE YORK CLOCK

Latest design, high-grade every respect, no projections that can be broken off. Runs eight days. Has heavy polished brass case. Dial measures 2¼".
Price.....$7.50

## THE ARGUS MIRROR
### PREVENTS ACCIDENTS



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With the Argus Improved Dash Mirror (protected by a hood from the sun's rays or rain) you have a clear view of the road behind without turning the head. Adjustable to any position.

Price, less shield..... $7.50
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We carry a large stock of every imported and domestic plug on the market.

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Keeps robes and wraps from being soiled in bottom of car. Heavy brass tubing, highly polished.

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| Adjustable folding rail . . . . . | 2.50 |

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HAVE THE SOUND that made imported horns famous. Twenty-one different styles in up-to-date designs. Send for Blanchard Horn catalog

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Enables a driver to direct powerful beam of light to any part of the dash board. Can see any indicator on the dash
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## PIRELLI CABLE

That wonderful Italian cable, used by well-known auto manufacturers in this and other countries. Our sample card showing sizes and prices, upon request.

The dealer who desires to handle the best line of Automobile Specialties, would do well to investigate our line of splendid and profitable goods. Our special show Catalogue will be sent on request.

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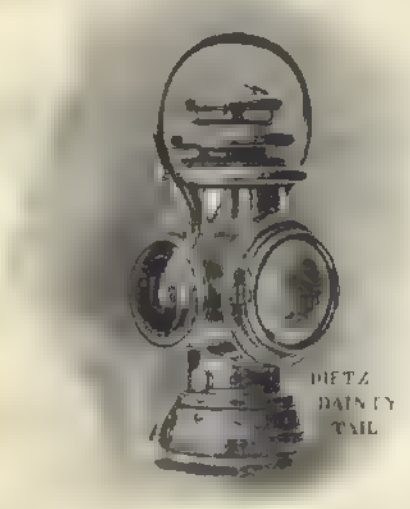
**Manufacturers, Importers and Wholesalers of Automobile Accessories**

# DIETZ "DAINTY" TAIL LAMP

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**Established 1840**

You need have no further concern about your rear signal, if you use the DIETZ "DAINTY" TAIL LAMP. It never blows out under the most trying circumstances, and is an ornament to your car, being well shaped, compact and beautifully finished. Combination socket, fits any standard make of fork.

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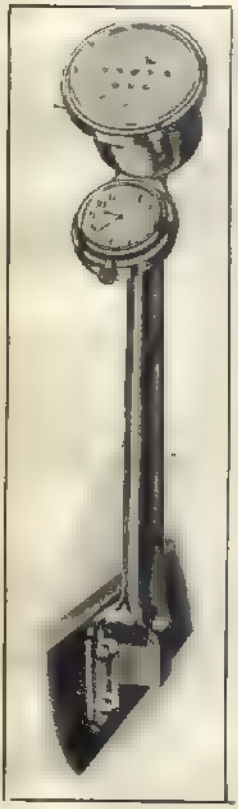
**Pioneers in the Motor Lamp Industry**

# Individuality

## There is in the Stewart



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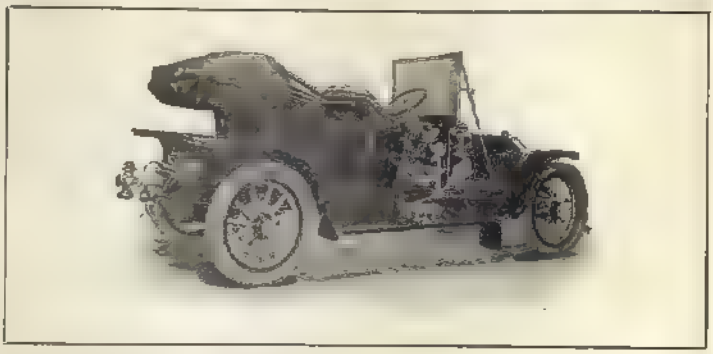
(Model 14)

**Designed for the highest powered highest priced racing or touring car**



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Gasoline and Electric—for Pleasure and Business

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from single to six cylinders, 6 to 60 H. P.

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MODEL "C," $2760

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A Lyre's the first appearance in America of a new book on Automobiles Containing all the modern features and improvements of the automobile in a new book. Explaining how to meet the needs of various Horseless Vehicles, how to repair, temper, harden, etc. The new methods of teaching the working models of automobiles explain the operation of the engine magneto and setting of valves at a glance. Price of book $3.00 Price of mechanical chart $1.00

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STEEL BALLS

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BALL BEARINGS

¼ Inch Shaft and Up No Fitting Just Push Them On.

10 Cents in Stamps for Sample.

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A MANUFACTURED CAR and the first SUCCESSFUL application of the VALVELESS, TROUBLELESS, TWO-CYCLE motor to a high-grade, high-power automobile.

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REO $500 and $1000

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Two New Companions for the Famous Edison

Double System Plug

Edison "Midget" Plug

All threads, $1.00

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The above trio of plugs constitute

"The World's Best"

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This oil is manufactured especially for the Packard Motor Car Co. of Detroit and their agents. It is the only genuine Packard Oil.

"IT MAKES A DIFFERENCE"

Manufactured by

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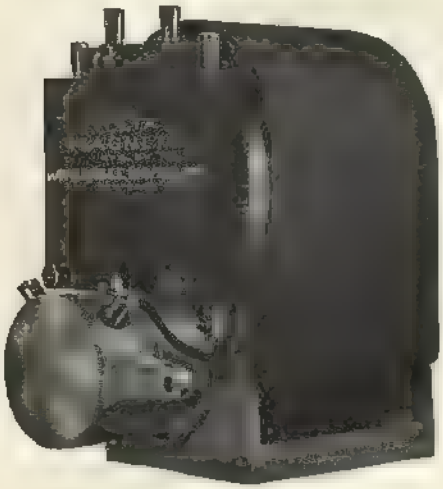
# VOLTA MAGNETO



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BrownriekaR

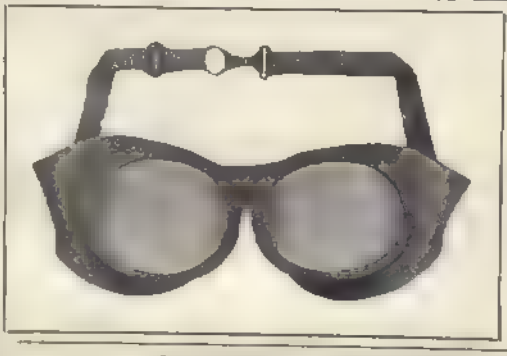
**Price, $175.00, F. O. B. factory**

The most popular, instructive and health giving device ever placed in the hands of the younger generation.

A practical best driven motor car capable of furnishing no end of amusement and instruction containing as it does all the elements of **a real motor car** that are necessary to a complete understanding of the modern automobile.

We have an interesting proposition **for the dealer.** Send for catalogue.

**OMAR MOTOR COMPANY, 31 Siegrist Street, Newark, New York**



# RUBBER GOGGLES

IN LARGE VARIETY

## Cover Rubber Goggles

Patented July 30th, 1907
June 16th, 1908

**Beware of Rubber Goggles not protected by COVER patents**

FOR SALE BY ALL JOBBERS

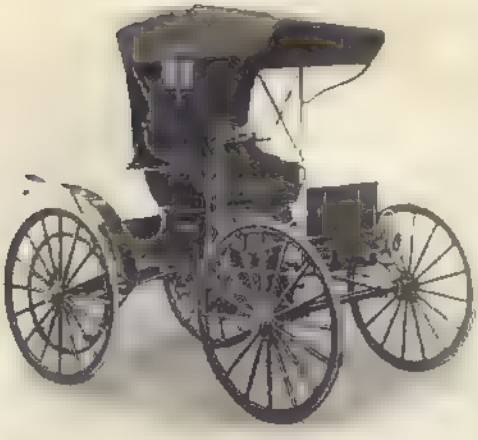
**SUSSFELD, LORSCH & COMPANY**
**37 and 39 MAIDEN LANE, NEW YORK**

# INFRINGEMENT NOTICE

Infringing Rubber Goggles are being imported into the United States, and dealers and others of the trade interested should know that these imported rubber goggles infringe the patents issued to H. S. Cover, South Bend, Ind., dated February 26 1907; April 23, 1907; July 30, 1907, and June 16, 1908, which cover the whole goggle and particularly the constrictively held lenses; the elastic tubes in the outer ends of which the lenses are supported, the flesh pads about the eyes at the inner ends of said tubes; the reinforcements at the ends of the flesh pads and between the eye tubes; and other features. It is the intention of the inventor to maintain his rights under these patents as is evidenced by the fact that he has begun suit in the United States Circuit Court for the Northern District of Illinois against The Beckley-Ralston Co.

**FINAL DECREE entered in favor of these patents, Nov., 30, 1908, in the CIRCUIT COURT of the UNITED STATES, DISTRICT of INDIANA.**

**Signed, Harvey S. Cover, Patentee**

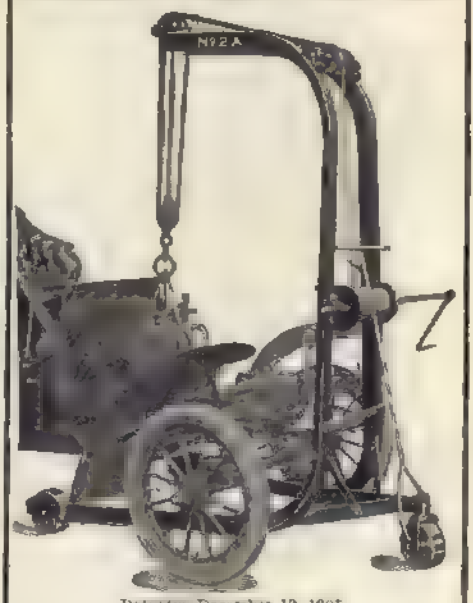


The simplest car of the high-wheeled type now on the market

*Write for catalogue and prices of our 1909 Friction Drive Car*

THE BUGGYCAR CO.
(INCORPORATED)
CINCINNATI, OHIO

## Hercules Portable Crane Hoist




Patented December 10, 1905
See how easy it does it. Pull's the bill for Automobile Factory and Garage Crane. Many of them using at Yon shop.

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# CRUCIBLE STEEL CASTINGS

FOR

# AUTOMOBILES

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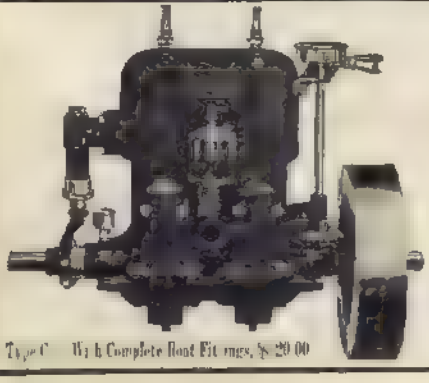
LEBANON, PA.



Type C With Complete Boat Fittings, $ 20 00

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The quality is there before the name is attached.

Sizes 2 to 12 H. P., one, two and four cylinder

WORKMANSHIP, MATERIAL AND SATISFACTION GUARANTEED

LIVE AGENTS WANTED IN UNOCCUPIED TERRITORY
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# Automobile Owner

If you are tired paying the usual high list prices for Auto Supplies, write for our 35% catalog.

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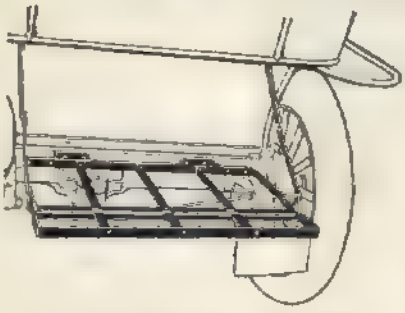
97 Chambers St., New York



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# Trunk Racks

For the Jobber, Manufacturer and Dealer.

Our racks fit any car, and are built for service.

Our prices will interest you. Write us.

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# DOW TUBES

"We don't believe the blooming old tubes ever wear out."
Plainfield Motor Car Co.

"After a year of experience I am thoroughly pleased with Dow Tubes"
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"Worth five times the price of ordinary tubes."
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**The Best Tubes Ever Manufactured**
**Are The Most Economical**
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Phila. Distributors: Auto Light and Motor Supply Co.
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For TIRE LUGS
SPARK PLUGS
and GENERAL SERVICE

**LIGHT STRONG RELIABLE**

1909 Wrenches better than ever. Heavier handles. Stronger tool. Better made. Nickel finish.

**Lug Wrenches, - 35c. each**
**Spark Plug Wrenches, 75c. each**

All sizes in Hexagon and Square opening

**WALDEN MFG. CO., 67 Deacon St., Worcester, Mass.**

# 1909 Crawford.

## Model H

**Model H, Light Touring Car**
**25 H. P. Price, $1300**

Model H is an entirely new design, planned to meet the requirements of those who want a high grade machine of standard design, sufficient horsepower, and light weight with accompanying low up-keep and yet at a moderate price. It has a 4-cylinder Rutenber motor—the cylinders being 4x4—which develops 25 H. P.; double ignition; cone clutch; selective type, sliding gear transmission; floating type rear axle, mounted on ball bearings. Double brakes on rear hubs. Wheel base, 104 inches. Tread 54 inches, weight 1,900 pounds. Furnished as a Runabout with Rumble seat for $1,250

Other Crawford models are:

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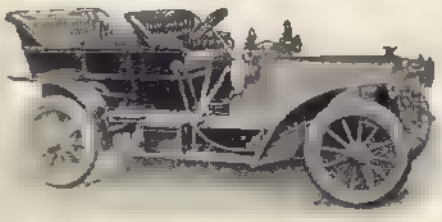
| Model "F" | 50 H. P. 7 passengers | $3500 |
| " "D" | 35 H. P. Runabout | 2500 |
| " "G" | 40 H. P. | 3000 |

Write for our interesting dealers' proposition

**Crawford Automobile Co.**
**Hagerstown, Md.**



**Model "G"—40 H. P.—$3000**

# AUTOMOBILE Headquarters

(NEW)

## SOUTHERN HOTEL

**Michigan Boulevard and Thirteenth Street**

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COMPLETE IN APPOINTMENT
ARTISTIC
ABSOLUTELY FIREPROOF

300 Rooms. 200 with Private Bath.
200 with Circulating Ice Water.

EUROPEAN PLAN

Rooms with Hot and Cold Water,
$1 00 and $1 50 per day.
Rooms with Private Bath, $1.50 to $3.00 per day.

ALEX. DRYBURGH, Pres. and Mgr.
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## New Annex Just Finished and Furnished

# NEW SERIES TIMKEN SHORT BEARINGS

Cone Roller One Piece Cage Ring Cone with Roller and Cage Assembled Timken Short Bearing Complete

In offering the Automobile trade our **New Series Timken Short Bearings**, we do so with the assurance that they are made from the same carefully selected steel and subjected to the same severe tests as our standard size Bearings.

The **New Series Short Bearings** are designed for use in axles where the bearings space does not permit the use of our regular series.

These Short Bearings are to be used in any axles, transmission or other places where Annular Bearings can be used. They carry **a much greater load** than Annular Bearings of the same length, **are smaller in diameter** and in addition will take as much **end thrust** as they do **radial load.**

Every bar of steel entering into Timken Products is made to our Timken analysis chemically—and tested to the Timken test physically—which means a rejection of **45 per cent.** of every ingot before quality of suitable purity and soundness for Timken Roller Bearings can be obtained. These new Short Bearings Cones are made from Timken case steel.

This is one reason why **65 per cent.** of the makers of high grade Automobiles and over **90 per cent.** of the commercial truck builders of this country use Timken Roller Bearings. Write for catalog and prices.

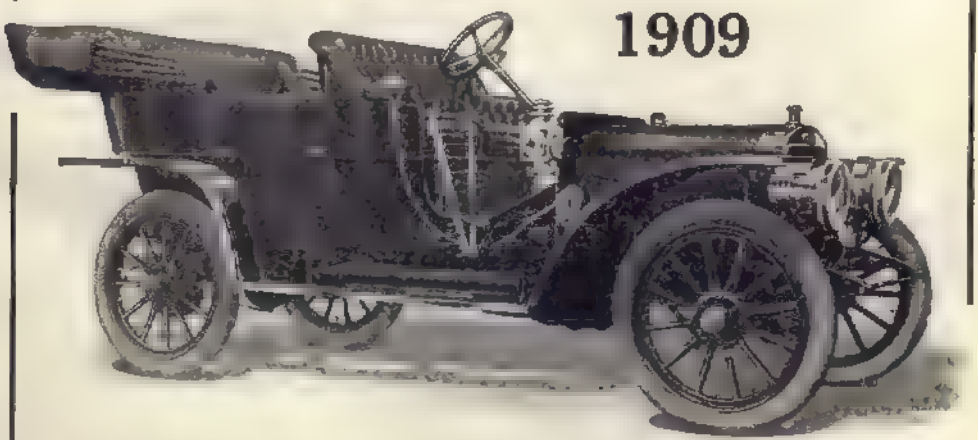
We will exhibit at Grand Central Palace, Dec. 31—Jan. 7th; Madison Square Garden, Jan. 16—Jan. 23, Chicago, Feb. 6—Feb. 13.

**THE TIMKEN ROLLER BEARING AXLE CO., Main Office, Canton, Ohio**

Branches: 10 E. 31st St., New York. 429 Wabash Ave., Chicago

# Dorris

## 1909

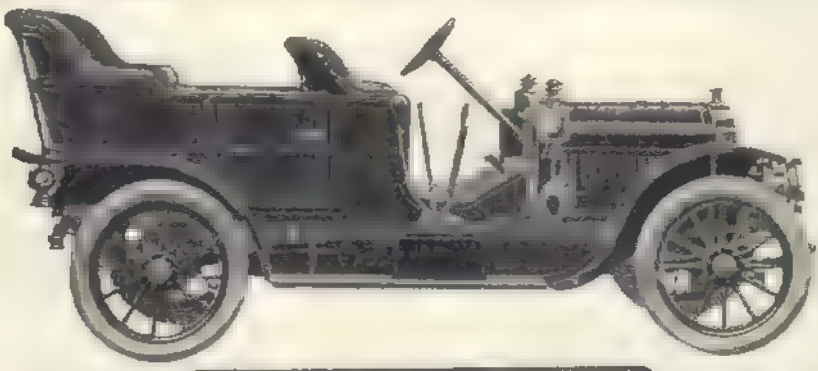


3-Point Suspension Valves in Head

**Price, $2,500**

DORRIS MOTOR CAR CO. :: :: ST. LOUIS, MO.

# Whether Your Satisfaction with Your Car is Full and Complete Depends Wholly on Whether Its Engine is Four-Cycle or Two-Cycle



**1909**

**Four Cylinder**

**$2500**

**Elmore**

VALVELESS 2 CYCLE

**1909**

**Three Cylinder**

**$1750**

Any doubt you may entertain will be dispelled the instant you understand the Elmore valveless two-cycle motor

It makes not a whit of difference what make your car is, or how many cylinders it has, or what horsepower it develops—if it is a four-cycle car **you are not getting what you think you paid for.**

Simply because no four-cycle car can give you the genuine satisfaction with its operation and up-keep that the Elmore can, nor true comfort every minute you are in the car; nor save you the unnecessary expense and exasperation the Elmore will save you.

Four-cycle or two-cycle, valves or no valves makes all the difference in the world.

With the four-cycle, you **must** take valves; with valves you **must** endure trouble, expense and dissatisfaction.

In the four-cycle you **must** put up with power intermittently applied—even in the six-cylinder—which means a car robbed of easeful, comfortable riding qualities.

The **only** escape from four-cycle disappointments is through ownership of the Elmore, because the Elmore is the **very highest development of the two-cycle principle.**

The Elmore has no valves, delivering you from complication and its irksome burdens—frequent overhauling and repairs, increased cost of up-keep.

Power generated and applied in **ceaseless** flow characterizes the Elmore engine. There are no pauses between impulses. Continuous turning power spells true tire economy and truly superb riding qualities.

Each year sees an increase in the number of Elmore converts. This year is an exception—the increase has been so much greater than in past years.

Eagerness for the 1909 output will clear our floors earlier in the coming season than the demand for previous models ever did in the past.

If you are to be among the happy, satisfied Elmore owners next year, do not disappoint yourself by delaying to place your order at once.

Hunt up the Elmore dealer, have a ride in the car, and send for 1909 literature.

## The Elmore Mfg. Co., Amanda Street, CLYDE, OHIO

Member Association of Licensed Automobile Manufacturers

**Exhibiting in New York only at the Madison Square Garden Show, Jan. 16 to 23**

## Wagenhals Motor Car Heater

**An innovation in motor car heating**
**No experiment**

A miniature hot air furnace; will maintain temperature of 70 deg. in coldest weather. Operating expense, 1 cent per hour. Installed in 15 minutes. A big seller.

Agents wanted. Season short, not quick

For particulars

**WAGENHALS MANUFACTURING CO.**
**4569 Washington Ave., St. Louis, Mo.**

## The Essex Carburetor

Perfectly Automatic under all conditions of atmosphere or speed of engine. Write for prices, and results will be a surprise to you.

**Essex Brass Foundry Company**
AMESBURY - - - - MASSACHUSETTS

HEADQUARTERS FOR

# FIAT

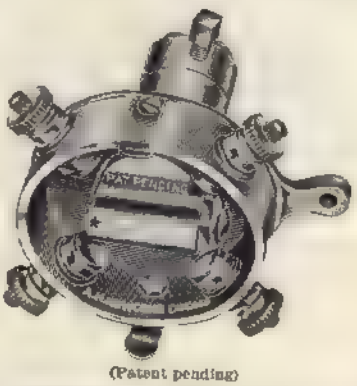
## Parts and Repairs

AS SUCCESSORS to Hollander and Tangeman, the original importers of FIAT Automobiles, we have continued to maintain their large stock-room of FIAT parts and have retained their special force of factory-trained mechanicians for FIAT repairs.

We are in a position to give prompt and efficient service to owners of 1904, 1905, 1906, 1907 and 1908 models.

**THE HOL-TAN CO.**
**244-West 49th St., New York City**

## "STAR" TIMER



(Patent pending)

Self-adjustable; runs in either direction and at any speed. Dust-proof and water-tight, and contains fewer parts than other makes. All working parts are adjustable.

With the STAR TIMER you use 50% less current than with any other. Guaranteed free from defects in either material or workmanship.

Made for one, two, four, six or eight cylinders.

Write for prices. Liberal discounts to dealers.

**A. H. NEWCOMB**
DEPT B
**815 W. 21st St. CHICAGO, ILL.**

## DIAMOND PULVIS VALVE GRINDING COMPOUND

THE BEST AT ANY PRICE

**The Only First Class Grind at 25c**

Because

Put up in collapsible tubes it is always moist.
No waste. Will not run into cylinder.
No emery or grit in glass.
Does not touch hands when applied.
Cannot gather dust.
Cuts rapidly and smoothly and leaves valve in perfect condition.
Used today by thousands with PERFECT SATISFACTION

Sold by leading jobbers

**EMPIRE SALES CO., Distributors**
**201 W. 106th St., NEW YORK**

## "K. C."

**"Kitsee Changeable"**
**DRY STORAGE BATTERY**

**Would a Sparking Battery with**

**A Life Guarantee**

**Interest You?**

Would you like a battery that you could exchange when discharged for a fully charged battery with any dealer, regardless of where purchased, by paying 35 Cents per Cell and without the annoyance of delay? Then ask your dealer about it or write us.

**SEE EXHIBIT**
at Madison Square Garden
**JANUARY 16 23, 1909**
**EBEN L. BEVAN, Genl. Sales Agent**

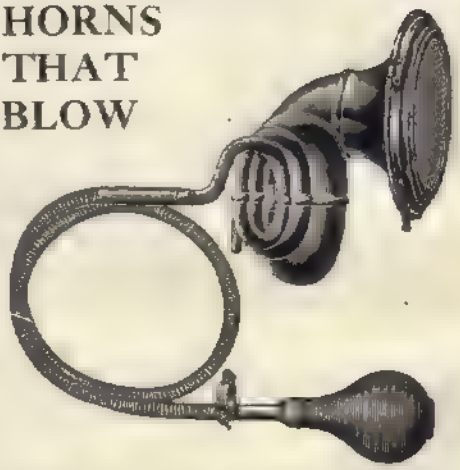
**KITSEE STORAGE BATTERY CO.**
628-629 Connell Bldg., SCRANTON, PA.

# MIDGET BI-CAR

The most comfortable Motorcycle produced. Built like a car. Agents better hear our proposition before closing contracts.

**Walton Motor Co. (Inc.)**
**Lynbrook, Long Island**
Sole Licensees and Manufacturers

## HORNS THAT BLOW



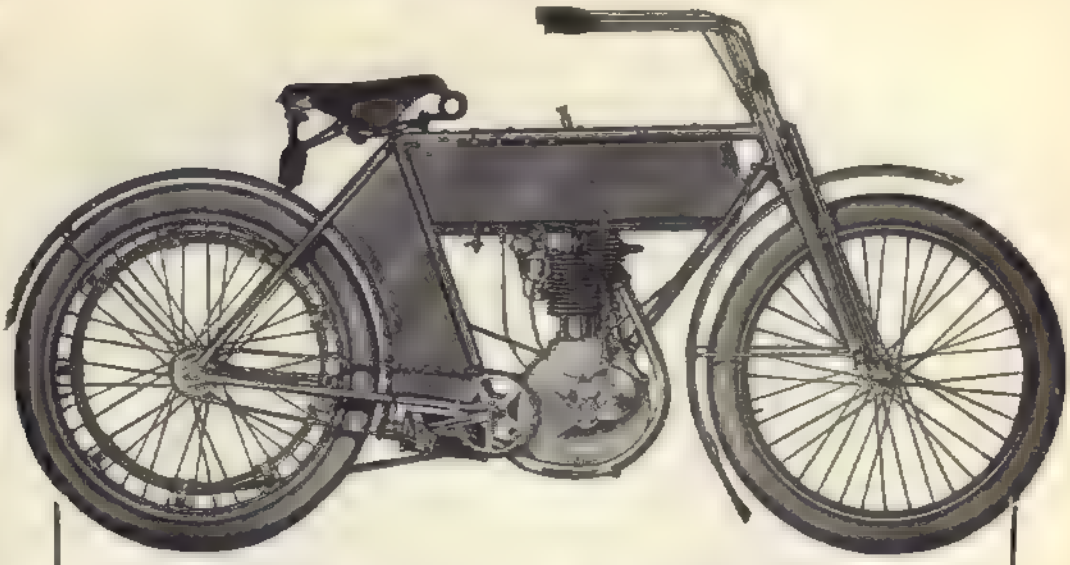
**R-K Reeds are Best Made**

**OLDEST AUTO HORN MANUFACTURERS IN U. S.**

Fifty Styles for Bicycles, Motorcycles and Automobiles

Manufacturers and Jobbers send for 1909 Catalogue

**THE RILEY-KLOTZ MFG. CO.**
17 Mulberry St., Newark, N. J.



# MOTOR CYCLE DEALERS

Do you know that EXCELSIOR DEALERS are Prosperous Dealers and that satisfied owners have made them so?

## EXCELSIOR AUTO-CYCLES

have been tried in every kind of real practical service and have **made good** every time.

Our 1909 Line and 1909 Propositions will be the best ever offered and will be backed by the experience, resources and business integrity of a company of thirty-two years' standing.

## EXCELSIOR AUTO-CYCLES

will be sold by established dealers only, no curbstone brokers or pocket agents, and at a fixed and invariable price.

If you mean business, so do we.

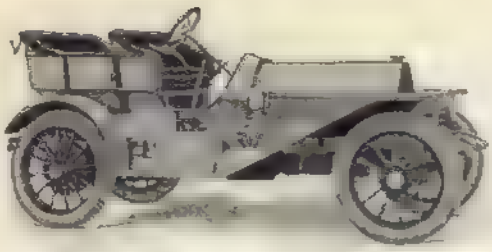
Let's get together.

---

EXCELSIOR SUPPLY COMPANY

233-237 Randolph Street - - CHICAGO, ILL.

ESTABLISHED 1876



Model "R" Roadster

# Glide

## $2000

## This 45-H.-P. Car Sells for $2000 and Represents $2000 of Automobile Value

THE GLIDE is not the type of car advertised to revolutionize the automobile industry, because it could not be as good as it is and sell at record-breaking prices. It is a standard American car sold at a standard price, and there all resemblance ceases.

—The price is sufficient to insure the best designs, materials and labor—necessary in the production of a satisfactory car.

The profit is not excessive and the car represents a full $2,000 [illegible] value.

Not because of its reputation, but because of the points brought out in a demonstration, the Glide interests both buyer and agent.

—There is no car built—so it may price—which has more worthy features [illegible] than the Glide.

The [illegible] from the [illegible] every [illegible] part of the [illegible] where [illegible] inspection [illegible] Glide [illegible]

The [illegible] are [illegible] with the price [illegible] The [illegible] made [illegible] part of the [illegible] very high-priced cars, and [illegible] the very highest-priced cars.

**Glide Model "G" Special Touring Car, seats 7; wheel base 120 inches; 34 x 4½-inch tires—$2,500.**

### We Want Every Buyer and Every Agent To Read These Specifications

—The power unit [illegible] separately [illegible] 45 (actual) [illegible] the rated [illegible] one. This is a grade never [illegible] the [illegible] cars. The price alone [illegible] the Glide.

—[illegible] form [illegible] type of transmission [illegible] absolutely [illegible]

—A [illegible] driving gear of [illegible] case-hardened [illegible] bush by [illegible] sprocket [illegible] Vanadium steel springs which do away with [illegible] shock [illegible]

—Accurately [illegible] power plant instantly accessible.

—Any [illegible] type [illegible] plate [illegible] that can't get out of [illegible] A [illegible] oiling system which [illegible] positive [illegible] requiring [illegible]

[illegible] brakes [illegible] from the axle [illegible] by expanding and external contracting—will hold car on any grade.

**36 x 4 tires Wheel base 108 in. Write today for catalog.**

**Special Notice to Agents** We are prepared to [illegible] a special proposition to [illegible] progressive [illegible] [illegible] [illegible] [illegible] [illegible] wheels [illegible] received a great number of [illegible] If you will [illegible] today we will gladly take the matter up with you at once. [illegible] is an excellent opportunity [illegible] for [illegible] [illegible] [illegible] [illegible] [illegible]

HAVE YOU READ THE

## Judges' Report of the 900-Mile A. C. U. British Reliability Trials?

OUR CELEBRATED CUSHION GRIPS

are very appropriately called "KUMFO" in Great Britain

We quote from the Official Report, as follows:

(summer) "Handles—With two exceptions there was nothing new in Handles. One exception was the Kumfo Grip which is certainly an improvement on the usual fitting, etc."

(Signed by Judges) J. W. G. Brooker, H. G. Cove, A. Geo. Reynolds, Archibald Sharp

THIS EXCEPTIONAL GRIP SHOULD INTEREST YOU

CAN YOU AFFORD TO PASS IT BY?

Made by MATTSON RUBBER CO., Lodi, N. J.
And sold by All First-Class Supply Men Everywhere

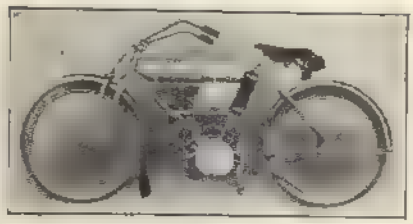
INDIANAPOLIS

## G & J Bicycle Tires

Everybody prefers these tires because they are the highest quality, the easiest riding and the easiest to repair when punctured. No tools required. No cement to hold them on the rim

Handled by all dealers.

G & J TIRE CO.
INDIANAPOLIS, IND.



## GREYHOUND MOTORCYCLES

¶ The latest product of the longest experience.

¶ We know that the 1909 GREYHOUND is unexcelled in matters of material, mechanical treatment, etc.

¶ We claim without qualification that there is no other motorcycle that approaches it in simplicity, ease of control or absolute comfort to the rider.

¶ THE GREYHOUND SHOCK ABSORBER IS THE GREATEST COMFORT DEVICE EVER APPLIED TO A MOTORCYCLE. This, in connection with our big tires and perfect spring fork, kills all shock and vibration.

¶ The boneshaking days of motorcycling are over. Take cobblestone pavements at ANY SPEED with a GREYHOUND SHOCK ABSORBER (patented) WITHOUT discomfort.

¶ NOW is the word in every department—machines for immediate shipment.

¶ We shall exhibit at the big shows, New York (The Garden), Boston, Chicago.

¶ Agency correspondence always welcome.

¶ Catalogues are free as air.

**The Auto-Bi Company**
Oldest American Motorcycle Manufacturers
1453 Niagara St., Buffalo, N. Y.

# Motosacoche

# Minerva

# Wagner

As usual, we will have the LEADERS for 1909 both American and foreign; and as heretofore we will continue to blaze the way for others to follow.

## Minerva, the Road King

The 1909 MINERVA will include among other improvements, the following
Bosch Magneto on all models.
G. and A. Carburetor, with Auxiliary Air Inlet.
Large Oil Pump.
Back Pedaling Brake, with larger and wider drum and Band Brake, operated by pedal near the footrests.
Throttle and Spark Advance controlled by handle bar grips
Continental non-skid tires.
Models to be carried 4½ and 8 H. P.

## Motosacoche, the Lightweight King

Bosch Magneto, shaft and bevel gear driven, the whole enclosed in a water tight aluminum case.
Mechanically operated valves.
"V" Belt Transmission.
Will develop 3 H. P.
Speed limit 45 miles an hour.
Weight of the Double Cylinder Model 80 pounds

## Wagner, the Endurance King

The Wagner riders have been clamoring for more power; the 1909 Wagner will be a full 3½ H. P., the cylinder measuring 3¼ by 3¼. The 1909 Wagner will also have
The Shamrock Gloria Rubber Belt, the best in Europe.
Double Grip Control
Float Feed Carburetor
Gasolene and Oil Capacity doubled.
Sager Spring Fork.

The Wagner is the only single cylinder model we will handle for the 1909 season.

Write to us for Agency propositions on any of the above.

(Prices on above models to be announced later.)

**Geo. V. Lyons Motor Co.**

**2382-4 Broadway, New York City**

# NSU

# MOTORCYCLES

**6 H. P. Touring Model**

Their popularity is based on solid and proven facts, and their complete state of perfection has induced an enormous demand in every state. Order early—"A word to the wise."

1¾ Popular Light weight, 80 lbs.
Single and Twin cyl. Touring Models
" " " F. A. M. Models
3 H. P. Twin cyl Mode. De Luxe
4 H. P. Single cy . Model De Luxe
7 H. P. Twin, Special Racer

# SPECIALTIES

**N. S. U. Two Speed Gear**
**N. S. U. " " Hub**
**N. S. U. Belt Fasteners**
**N. S. U. Non-Skid Device**
**N. S. U. E.S. Spark Plugs**
**AND**

## Shamrock Gloria Rubber Belts

The Record 70 Miles an Hour

The World's Best Belt

**SEE US AT THE**
**New York and Phila. Shows**

**N. S. U. Motor Co.**

**206 W. 76th St., New York**

# Let's Get Down to Facts!

Don't you want the easiest riding the strongest, most powerful and the best built machine you can get?

Do you know **why** the many exclusive features of the **CURTISS** make it just **that** machine?

It's easy to figure out.

**CURTISS** engines are roller bearing throughout. Hardened and ground steel rollers running between two hardened and ground steel bushings. Easy running, positively indestructible, no trouble from heating or running dry. (Compare them with bronze.)

The **CURTISS** 28 V Belt Transmission is the best in the world for motorcycles. Used exclusively abroad. Clean, silent, economical, requires no attention. No severe tension on bearings. (Compare it with other forms of transmission.)

The **CURTISS** trussed frame and fork is the strongest construction known. Frames never break down or get out of alignment. The long wheel base assures easy riding, so necessary on a long tour or in every-day service. The large fuel capacity, correct motor position, etc., are features not to be ignored.

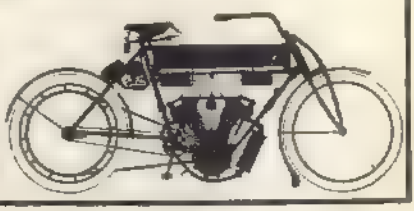
"There's no doubt about their being fast."

World's record, 1 mile single cylinder, 56⅘ sec. World's record, 1 mile double cylinder, 46⅖ sec.

## "Powerful and Reliable"

Only Diamond Medal 1907 F. A. M. Endurance Run
Highest Awards, both classes, 1908 F. A. M. Endurance Run

Two new models for 1909, 3½ and 7 H. P. Don't fail to learn about them. We're now closing up territory. If you want to handle the best, better write to-day.



**G. H. CURTISS MFG. CO.**
**HAMMONDSPORT :: NEW YORK**

*Just think of "STANDARD" when you are in the market for*

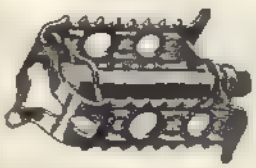
# Bicycle & Motorcycle Parts

**They are all that the name implies**

In **Spokes** and **Nipples**, **Pedals** and **Toe Clips** we have the following models to offer

**SPOKES** and **NIPPLES** are high-grade and up to the standard in every particular "Sunbeam" Spokes make a very attractive wheel and glisten like sunbeams; hence the name

**"Star," "Bridgeport"** and **"Standard" Pedals** are machined pedals, insuring accurate bearings and durability. Made for men's, women's and children's bicycles and motorcycles.



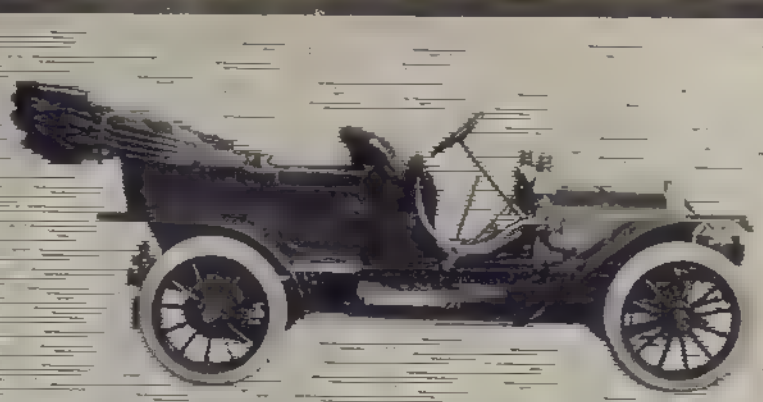
NO. 3 STAR R. T. PEDAL

**"Sager"** and **"Star"** Toe Clips hold the foot securely without undue pressure.

Bicycles and motorcycles with "Standard" equipment, always give satisfaction; so be sure to specify it.

SAGER

**THE STANDARD COMPANY, Torrington, Conn.**



# HAYNES

The Haynes for 1909.

40 H. P. $3,000

## Cars That Go Are The Cars That Sell

**Haynes cars run. They always run. In the Agents' Parlance, they "stand up."**

Dive into the Haynes mechanism and you will see why.

There's a clutch that is really jerk-proof, working like a contracting band brake, metal to metal, so that you cannot convey a shock to the motor if you try. That means long motor life

No leather to renew on the clutch—long clutch life

A ratchet in the gears preventing stripping—long gear life.

Brakes water-cooled, non-burning—long brake life.

A unique direct-drive system that saves wear, friction, thrust and noise, and solves the old rear axle problem. Long life there

Solid, substantial construction all over—long life all over.

No wonder the two Haynes cars were both among the five that won perfect scores in the great Chicago Motor Club Reliability Run.

The Haynes always makes a perfect score

## AGENTS!

**Do you realize what such facts mean to you? Your profits are not eaten up by efforts to keep the cars running after they are sold. And when the result of a big Reliability Run is telegraphed to every paper in the country, with Haynes Perfect Scores always sticking up in the record like the proverbial sore thumb—do you see where you get off if you have the rights in your territory? We're ready to talk business.**

### SPECIFICATIONS OF THE HAYNES FOR 1909

Motor—4 cylinder, 4¼ x 5.
Water Cooled, with very large water jacket.
Drive—Shaft drive, with Haynes roller-pinion and sprocket at the rear axle, which minimizes friction and side thrust and eliminates noise entirely.
Clutch—Haynes patent contracting steel band upon bronze drum.
Carburetor—Latest type Schebler, water jacketed.
Lubrication—Gear driven McCord oiler
Ignition—Bosch Magneto; also battery system with single coil and separate set of plugs.
Bearing—Roller bearings used throughout
Tires—36 x 4 all around.
Transmission—Selective type, three speeds forward and reverse. Ratchet device makes gear stripping impossible.
Wheel base—112 inches. Tread—56 inches.
Body—Touring car for five or seven, or toy Tonneau, $3,000. Runabout or Hiker type, $2,900. The Hiker type consists of two bucket seats with large gasoline tank on rear
Equipment—Includes Prest-O-Lite tank, baggage rack and tire holders.

HAYNES AUTOMOBILE COMPANY, Kokomo, Indiana

Oldest Automobile Manufacturers in America. MEMBERS A. L. A. M

NEW YORK, 1715 BROADWAY CHICAGO, 1701 MICHIGAN AVENUE

*12 HIGHEST AWARDS AND PERFECT SCORES*

# INVADER GEAR OIL

ASSIST THE FULL DRIVING POWER OF YOUR MOTOR; don't retard it. How can you assist it? By using a gear oil that guarantees the least amount of friction and wear. It is in the gear case that the great driving power of your motor is most keenly felt, and you must provide for the constant meshing and unmeshing of the gears.

INVADER GEAR OIL is an oil of superior quality, scientifically manufactured – not the product of guess-work. It meets all the requirements of an ideal gear lubricant. For PACKARD FRONT GEARS, general Transmission and Differential Gears.

# INVADER OILS

A CAN FULL OF SATISFACTION

## INVADER CYLINDER OIL

### The Pioneer Light Oil

It is made in three grades – light, medium and heavy. You name the car, we'll name the grade.

*"Be sure it's INVADER, then go ahead"*

## CHAS. F. KELLOM & CO.

113 ARCH ST. :: :: :: :: PHILADELPHIA

PHILADELPHIA BRANCH: 648 N. Broad Street
BOSTON BRANCH: 284 Columbus Avenue

## AUTOMOBILE SUPPLY MFG. CO.'S NEW HORN

The accompanying cut illustrates a new horn just brought out by Automobile Supply Mfg. Co., the well known horn manufacturers of Brooklyn, N. Y. Its most important features are its novel design, compactness and its rich, penetrating tone. The price is also said to be attractive

Automobile Supply Mfg. Co's. New Horn

This company has recently added to its manufacturing facilities by taking the premises No. 220-224 Taaffe Place which with their factories at 218-220 Classon Street and at 139-147 Emerson Place gives them a total of 35,000 square feet of floor space.

## FREE OIL CAN BRACKET FOR "OILZUM" USERS

The White & Bagley Co., Worcester, Mass., are furnishing free of charge to users of their "Oilzum" cylinder oils, a handsome bracket for holding an extra

The "Oilzum" Oil Can Bracket.

can of oil on the running board of the car. This bracket is very easily attached by means of two screws in the under side of the running board. The bracket and method of holding the can by means of a strap passing over the top and down the front are clearly shown in the accompanying cut. The device is very attractive and, with the can of oil in its grip, adds to the appearance of the car.

## BOUQUET HOLDER FOR LIMOUSINES THE LATEST NOVELTY

The latest novelty in the automobile specialty line is a bouquet holder for limousines and C. Cowles & Co., of New

Cowles Bouquet Holder.

Haven, Conn., are among the first on the market with this specialty. Their bouquet holder is here illustrated. It is made of crystal cut glass and is held by brackets of silver, gold, brass or gun metal. In addition to the style here shown, they have a variety of cornucopia shaped holders, also cylindrical and other shapes. Besides plain cut glass with gold decorations, these holders are furnished in tinted glass

## "RADIATOR DECALCIFIER"

General Accumulator and Battery Co., 134 Second street, Milwaukee, Wis., are putting out a solution for removing lime deposits and incrustations from radiators and other parts of the circulation system. They call this preparation "Radiator Decalcifier," and it is a gelatinous substance which readily mixes with the cooling water. Combining quickly with the calcium accumulations, it dissolves them. It is said to be perfectly harmless to metals List prices range from $12 per dozen pint cans to $30 for ½ dozen gallon cans. Sample cans are furnished at the list prices. Discounts are quoted on case lots.

This company also manufactures a preparation called "Stop-Leak" for repairing leaks in radiators, water pipes, crank cases, tanks, etc. "Stop-Leak" is a metallic powder which after being moistened into paste form will set into solid metal and amalgamate with the metal to which it is applied. Three ounce boxes list at $1, half pound boxes at $1.75, pound boxes at $2.50, and 5-pound boxes at $10. Discounts to the trade on case lots.

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The Car With Class

The *Marion* Flyer

$1850

Equipped with Detachable Toy Tonneau or 5 passenger Touring Car body.

1 H. P. to every 52 lbs. of actual weight.

Don't fail to see this car at the Grand Central Palace, December 31--January 8.

Write for Specifications to

Marion Motor Car Sales Co.
Indianapolis - - - - Indiana

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# MOBILE TIRES

You can make no mistake in specifying **G & J TIRES** because there are no better tires manufactured. We make this statement because we know how G & J tires are made—know the kind of materials they are made of—know the kind of service they give and how they compare with other tires.

*We shall exhibit at both the New York Auto Shows. Call and see us or write for our catalogue and prices*

**Indianapolis, Ind.**

OMAHA—1607 Harney St.
ATLANTA—35 N. Pryor St.
ST. LOUIS—415 N Fourth St.
BOSTON—110 Federal St.
PORTLAND—326 Burnside Ave.
KANSAS CITY—1607 Grand Ave.
CLEVELAND—326 Frankfort Ave.
PITTSBURG—Baum and Beatty Sts.

McIntyre

LINE OF HIGH WHEEL

# Motor Vehicles

## TEN NEW 1909 MODELS

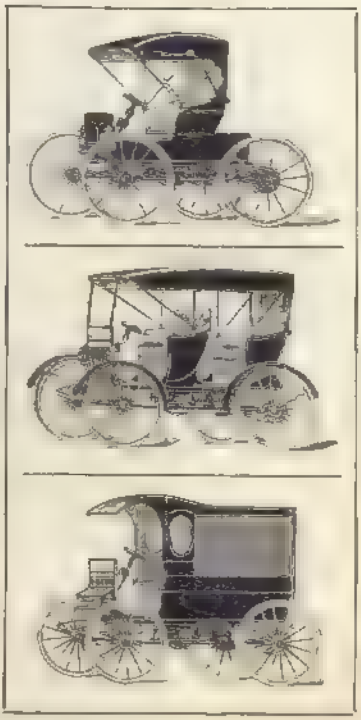
Air cooled, four-cycle, planetary transmission, two speeds forward, one reverse. Solid rubber tires. Mechanical oiler. Wheel steer.

Two-cylinder, double opposed, offset type, chain drive, 12-14, 16-18 H. P.

Four-cylinder, shaft drive, 28-32 H. P.

One, two, three seated Pleasure Vehicles and full line of Commercial Wagons.

**Visit our exhibit, New York and Chicago Shows**
**Write for Catalog No. 46**



**W. H. McINTYRE CO.** (*Standard Manufacturers A. M. C. M. A.*)
**AUBURN, INDIANA**

256 Broadway, NEW YORK — 1730 Grand Ave., KANSAS CITY — Tudhope-McIntyre Co., ORILLIA, CANADA

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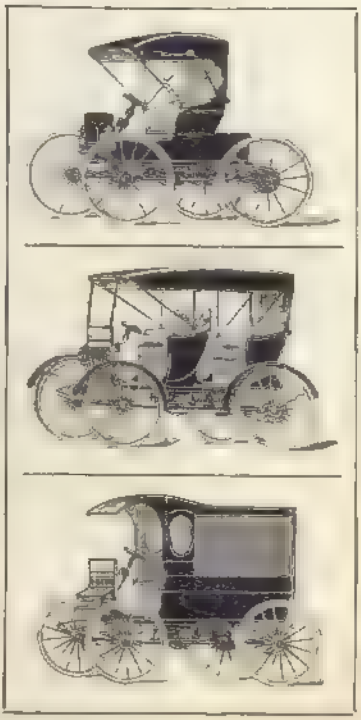

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**AUBURN, INDIANA**

256 Broadway, NEW YORK — 1730 Grand Ave., KANSAS CITY — Tudhope-McIntyre Co., ORILLIA, CANADA

# GRAMM-LOGAN COMMERCIAL CARS

## The "Great Trio" in Business Wagons

### Model "X" Three-Ton Truck Chassis

A masterpiece of design and construction. Equipped with a 45 H P Motor, built to carry with ease the load for which it is rated. Will give consistent service year in and year out. Price, **$3,500**

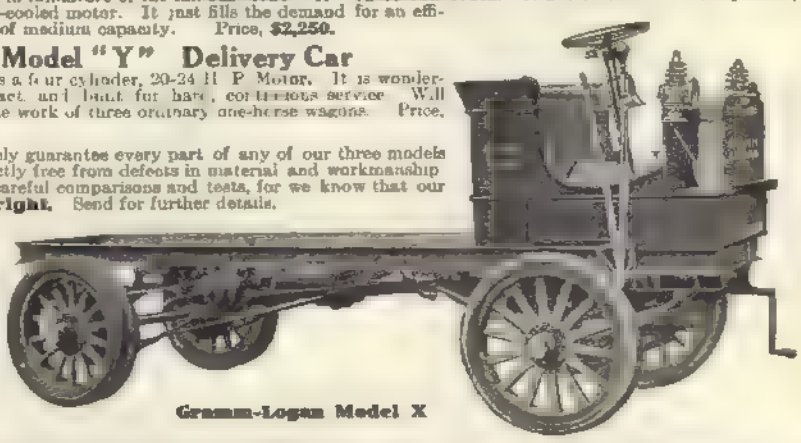
### Model "V" One and One-half-Ton Truck Chassis

A duplicate in miniature of the famous Model 'X' Three-Ton Truck. It has a 25 H P four-cylinder, vertical, air-cooled motor. It just fills the demand for an efficient truck of medium capacity. Price, **$2,250.**

### Model "Y" Delivery Car

This car has a four cylinder, 20-24 H P Motor. It is wonderfully compact and built for hard, continuous service. Will easily do the work of three ordinary one-horse wagons. Price, **$1,600.**

We positively guarantee every part of any of our three models to be perfectly free from defects in material and workmanship. We invite careful comparisons and tests, for we know that our trucks are **right.** Send for further details.



Gramm-Logan Model X

## THE GRAMM-LOGAN MOTOR CAR CO., Bowling Green, Ohio

Will exhibit at Grand Central Palace, N. Y., December 31st to January 7th, 1909.

# 5 TON HEWITT TRUCK

## "BEST BY TEST"

**3-TON—2-TON—LIGHT DELIVERY—ALL SATISFIED**

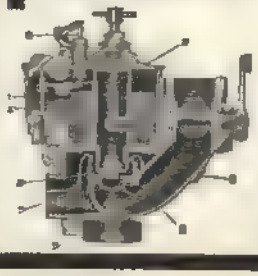
## HEWITT MOTOR CO., 10 E. 31st St., New York City

# SAURER MOTOR TRUCKS

THE COMMERCIAL MOTORCAR CO.

TIMES BUILDING, 42ND STREET AND BROADWAY, NEW YORK, N. Y.

# Palmbla 'Syphon' Carburetor



1909 MODEL

**FLEXIBLE CHOKE TUBE and ONE AIR INTAKE** creates complete vaporization at all motor speeds. We are ready to prove our claims.

**THE NORTH CHICAGO MACHINE CO.**

NORTH CHICAGO - - - - - - ILLINOIS

# DON'T Purchase a Horseless Wagon

until you have seen the "Couple-Gear."

4-wheel drive and steer. 4 sizes. Battery or Gas Electric type. Send for catalogue. Agents wanted. Address

**COUPLE-GEAR FREIGHT WHEEL COMPANY**

560 Buchanan Street - GRAND RAPIDS, MICH.

# CRAMP

**Parsons' Manganese Bronze Axles**

Stronger than steel. Thousands in use. None have ever broken.

The Wm. Cramp & Sons Ship and Engine Building Company Philadelphia, Pa.

100 MANUFACTURERS Using and Testing **INDESTRUCTIBLE STEEL WHEELS** O. K. them in every way. Write us for information **Indestructible Steel Wheel Company** 1291 Michigan Ave. 4274 Chicago

# Van Motor Wagons

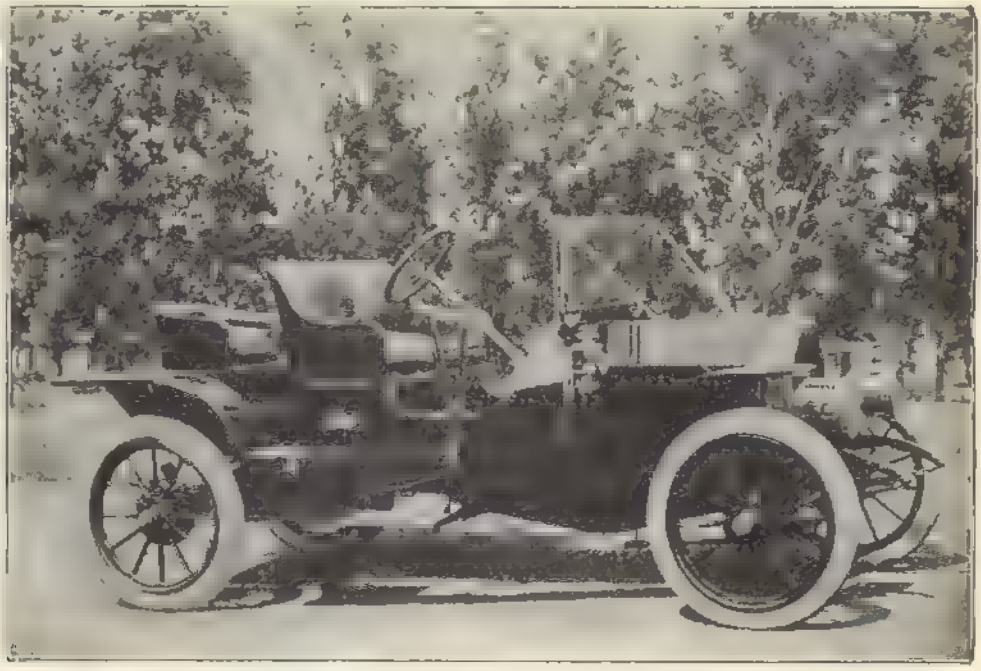
Our output sold for several months ahead. Orders accepted for delivery in 4 months only.

**H. F. VAN WAMBEKE & SONS**

Elgin, Illinois

# Here's a Hot One Right Off the Griddle

# Moline



## A Remarkable Car for Little Money

A car which has a lot of good points; so many, in fact, that printer's ink tells only half the story—a story well worth listening to, if you want a run for your money.

# The MOLINE Nineteen-Niner

**IS SNAPPY—RAKISH—RACY**

But That's Not All—It Has: **Three-point Suspension Unit Power Plant. Lots of Power and Speed—a Hill Defier and Time Annihilator. Every Working Part Easily Accessible. Magneto when Desired**

Eastern Agents Should Investigate Before Closing 1909 Contracts

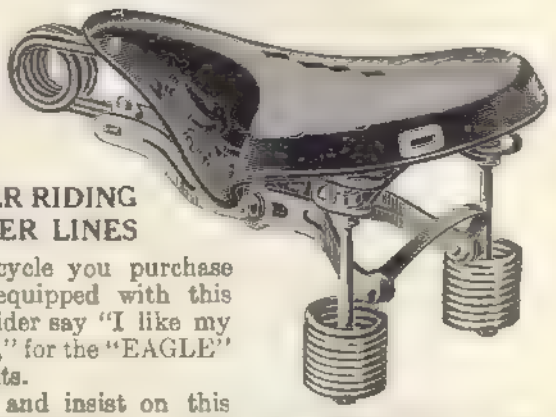
**Moline Automobile Co.** Standard Manufacturers, A. M. C. M. A **East Moline, Ill.**

# "The Best Motorcycle Saddle Ever Manufactured"

ALLOW US TO PROVE THIS TO YOU

## Why Not Have the Best?

This is the comment we receive on the TROXEL EAGLE MOTOR SADDLE. This statement covers the following points.



Troxel Eagle Motor Saddle

Length, 13¾ Inches
Width, 12 Inches

MORE DURABLE, EASIER RIDING
LOWER POSITION, FINER LINES

No matter what Motorcycle you purchase you will like it better if equipped with this Saddle. No longer can the rider say "I like my Motorcycle all but the Saddle," for the "EAGLE" is a combination of good points.

MR. DEALER, specify and insist on this Saddle when ordering your Motorcycles. It will make you friends and money.

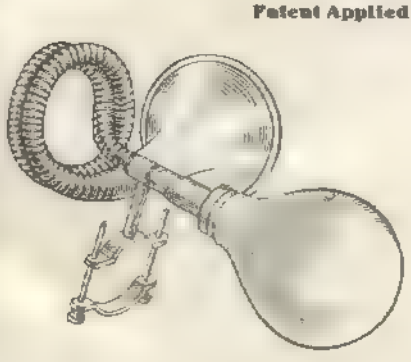
WRITE FOR CATALOG

**The Troxel Manufacturing Co., Elyria, Ohio**

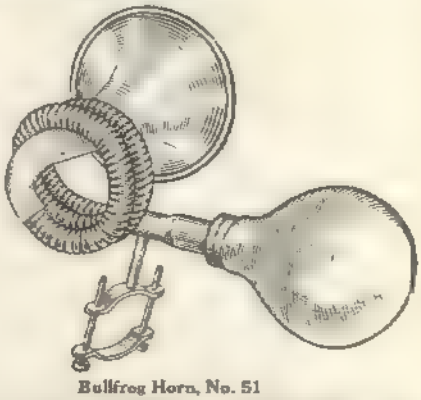
# MOTOR CYCLE HORNS

## SOMETHING NEW

Patent Applied For



Bullfrog Horn, No. 50



Bullfrog Horn, No. 51

## Bends are made of Flexible Tubing

**Fine Deep Tone. Low in price**

No. 50, bell 3¾ inches. No. 51, bell 4 inches.

These horns are New and Novel and are first-class goods Large bulbs (our No 68) on both horns Brass only Order through your jobber. Best selling horns made Electros free.

**STEVENS & CO., 99 Chambers St., N. Y. City, U. S. A.**

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5-H. P. 2-cylinder [illegible] ... $225 00
4-H. P. [illegible] ... 200 00
2½-H. P. GEER Model 4 ... 150 00
Used motor-cycles ... 40 00

We have the largest line of new and used motorcycles in the country at the lowest prices. Every machine guaranteed. Repairs a specialty. Motors and castings for air-ships. Motors for railway velocipedes. Send for catalogue.
Harry R. Geer Co., 856 Mclarns Ave., St. Louis, Mo.

## Make a Motorcycle of Your Bike

at small cost by using our Attachable Outfit. It fits any bicycle. Send stamps for catalog. Also Motor Attachments for railroad velocipedes. Send 15 cts. for "The Motor-Cycle Manual." It treats of motor-cycles; how to get more power, etc.
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## F. A. BAKER & CO.
MOTORCYCLE SUPPLIES
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BRAZE IRON FOR A AND J BRAZING CAST IRON

A HOT BLAST BURNER
Adjustable for Width and Diameter
One Burner fits all wheels. Write
THE A. & J. MFG. CO.
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Repairs, Parts and Supplies
Indians, Thors and Royals
Send for complete catalogue.
F. B. WIDMAYER, 2312 Broadway, New York City

## —SPROCKETS—
for Bicycle and Motorcycle
WE MAKE 90 PER CENT OF THE SPROCKETS USED
THE PARISH & BINGHAM CO.
Cleveland, Ohio

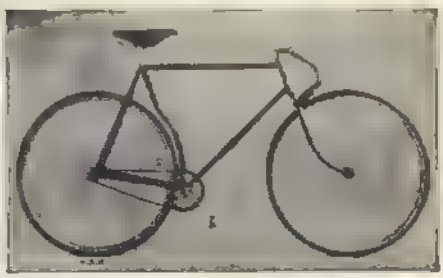
THE STAR

Who would think of building Bicycles, Coaster Brakes, Lawn Mowers, Sewing Machines and etc., etc., without using The STAR BALL BEARINGS therein?

WHO, tell us?

THE STAR BALL BEARING CO
LANCASTER, PA., U. S. A. and BERLIN S. O. 36, GERMANY

## J. W. GRADY & CO.
WORCESTER, MASS.



## The New England Racer
The only sprint wheel in the world properly built for board tracks.
Agents wanted all over the country

THE WEAR WELL
## Rubber Bicycle Grip
Every progressive dealer should have them in stock.

## MOTORCYCLE SUPPLIES
SEND FOR CATALOGUE

More Agents Wanted

2 H. P.

## 1908 ERIE MOTORCYCLE
LIST PRICE, $175

We have also a special outfit for converting the bicycle into an up-to-date motorcycle. Send for other catalog.
MOTORCYCLISTS—send 15 cents for our new book "The Motor-cyclist." It tells all about the care of motorcycles.
MOTORCYCLE EQUIPMENT & SUPPLY CO. 3 LAKE ST., BINGHAMTON, N. Y.

## TORPEDO MOTORCYCLES
Torpedo stands for Quality and Quality means Price. Buy a Torpedo and get both. Write for Catalog
We make the following Models for 1909

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|---|---|
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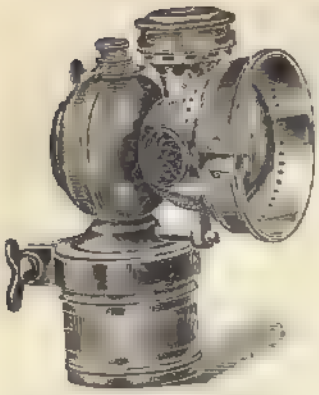
| " C | 225 00 |
| " G | 250 00 |
| " F Twin Cylinder | 275.00 |

Hornecker Motor Mfg. Co., Geneseo, Ill., U. S. A.



# 20th Century for 1909

## Cycle & Motor Cycle Lights

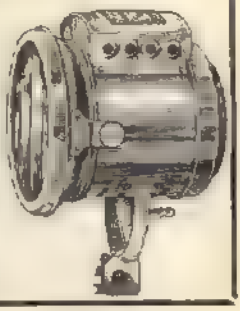
**are the leaders**

**Consult New Catalogue and New Price-List**

**Also a Fine New Searchlight for**

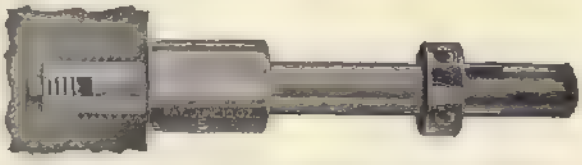
## AUTOMOBILES

*Better See and Learn Prices Before Placing Order*



20TH CENTURY MFG. CO., 19 Warren Street, New York

# OUT COMES THE TAP



No matter whether it breaks at or below the surface of the work, the Walton Broken Tap Extractor will remove it, leaving the threads in perfect condition. If you keep this tool handy, you need never dread having a tap break. No more lost time, lost temper and ruined work. Write for booklet.

**THE WALTON CO., 306 Pearl St., Hartford, Conn.**

# "Merit Exemplified"

**IN**

# "The Knight Autoshield"

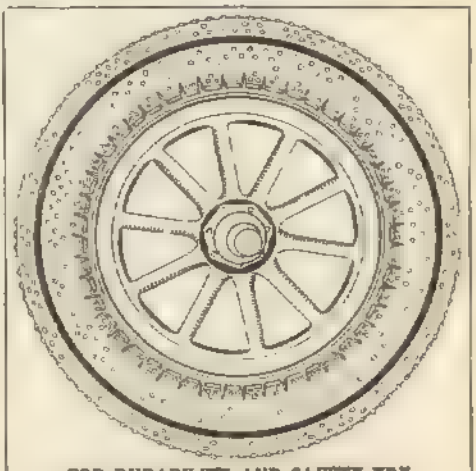
Four new '09 models finished in Mahogany, Circassian Walnut, Vermillion, Brazil Holly and other foreign woods; also tubular brass, Gun Metal and German Silver.

Creations of taste to satisfy particular people.

Manufactured only by the originators:

## H. C. KNIGHT & CO.

**1725 Michigan Ave., CHICAGO, ILL.**



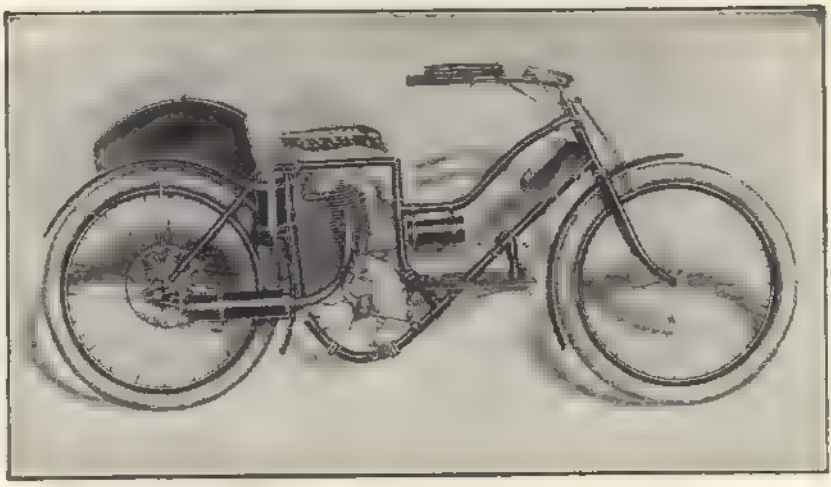
**FOR DURABILITY AND SAFETY TRY THE TWENTIETH CENTURY TIRE PROTECTOR**

No possibility of Punctures, Blowouts or Skidding, as the Twentieth Century Protector not only covers the tread, but the entire tire and makes a solid casing as good as new. Our patent mechanical way of attaching them to the rim makes them air perfect. They cannot budge after being put on the tire. Manufactured of the best imported French leather and air perfect lined with leather they do not damage the casing. They cost a great deal less than new tires and last much longer. Prices range from $4.00 to $24.00 each according to size. We ship them to any reliable party subject to examination before paying for same. Write for free sample for 10 days and we will explain details of the many advantages over all others. Agents wanted everywhere.

**TWENTIETH CENTURY TIRE PROTECTOR CO.**
**Midlothian, Texas**

# 1909

# New Era Auto-Cycle



PATENT PENDING

We call attention to the fact that the New Era Auto-Cycle is the most comfortable riding Auto-Cycle ever built.

WE LEAD, as the New Era Auto-Cycle is the first and only machine on the market of its class. It has been thoroughly tested, and the highest state of perfection reached. See our exhibit, space 552, at Madison Square Garden, January 16 to 23.

## Good Features

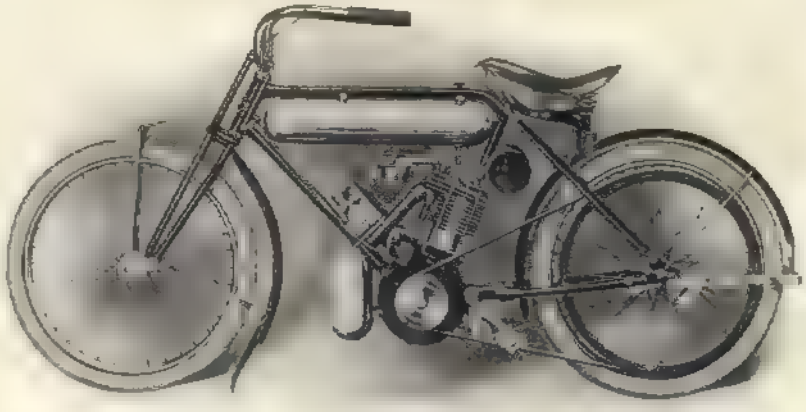
TWO SPEEDS. SLOW AND HIGH SPEED AND BRAKE ARE OPERATED BY THE FEET ON THE FOOT BOARD. FREE MOTOR. COMFORTABLE FORM SEAT. 60 INCH WHEEL BASE. MOTOR IS STARTED BY MEANS OF A CRANK, SAME AS AN AUTOMOBILE. 3½ H. P. SINGLE CYLINDER MOTOR.

Dealers interested should write for catalogue now.

## The New Era Gas Engine Company

### 7 Dale Ave., DAYTON, OHIO

# M-M



MAGNETO SPECIAL, 3½ H. P.

Shown at space 535, Madison Square Garden, New York, Auto Show

Conceded by far the best Motorcycle exhibit at the Show.

Five distinct models with more improvements than all others combined.

Look the line over. Secure a catalog. Let us tell you the "WHYS."

"It's then up to you."

## OTHER 1909 MODELS

| | |
|---|---|
| M. M. Battery Special - - | 3½ H. P. |
| M. M. Magneto Twin - - | 7 H. P. |
| M. M. Roadster - - - | 3 H. P. |
| M. M. Battery Twin - - - | 6 H. P. |

## AMERICAN MOTOR COMPANY

715 Centre Street BROCKTON, MASS.

# BABCOCK ELECTRICS

are the PAR EXCELLENCE of electric carriage manufacture. They are luxury, elegance and economy combined. They are ideal for ALL members of the family and for all occasions. Let us prove to you that BABCOCKS are the greatest electrics. Send us your name.

BABCOCK ELECTRIC CARRIAGE CO. - Buffalo, N. Y.

Oakland

## The OAKLAND is the answer to the man who says "Show Me"

Oakland Forty. Four Cylinder. Shaft Drive, $1600

It is a good, old-fashioned American habit, whether buying a cigar or a ten thousand dollar house, to look into things a little before spending your money and see that you are paying not one cent more than is necessary.

You select an automobile for what it is and for what it will do.

Of course some foolish people will continue to pay fancy prices for a maker's name.

But if we can show you a bigger, better automobile for $1600 than any other maker anywhere is producing, don't you think it part of wisdom to look into it before buying?

Why should you pay from 50 to 100 per cent. more for a car that will do no more than the Oakland "Forty"?

It has a forty horsepower motor with cylinders cast in pairs, 112-inch wheel base, seats five people without touching elbows, and in every little appointment is luxurious and easy-riding. Compare it with any high-priced car and you will wonder how the other fellows ever get people to pay the long price for cars no better appointed than the Oakland.

Light weight, 2,000 lbs., means low cost of maintenance. Big 34-inch wheels, 4-inch tires, steel I-beam axles—nothing cheap about the Oakland—simplicity of construction and scientific manufacturing system alone can account for the phenomenally low price.

This is the car you want to buy, and if you are an agent it is the car you will want to sell, if we have open territory in your locality.

**OAKLAND MOTOR CAR CO.,** 208 OAKLAND AVE., PONTIAC, MICH.

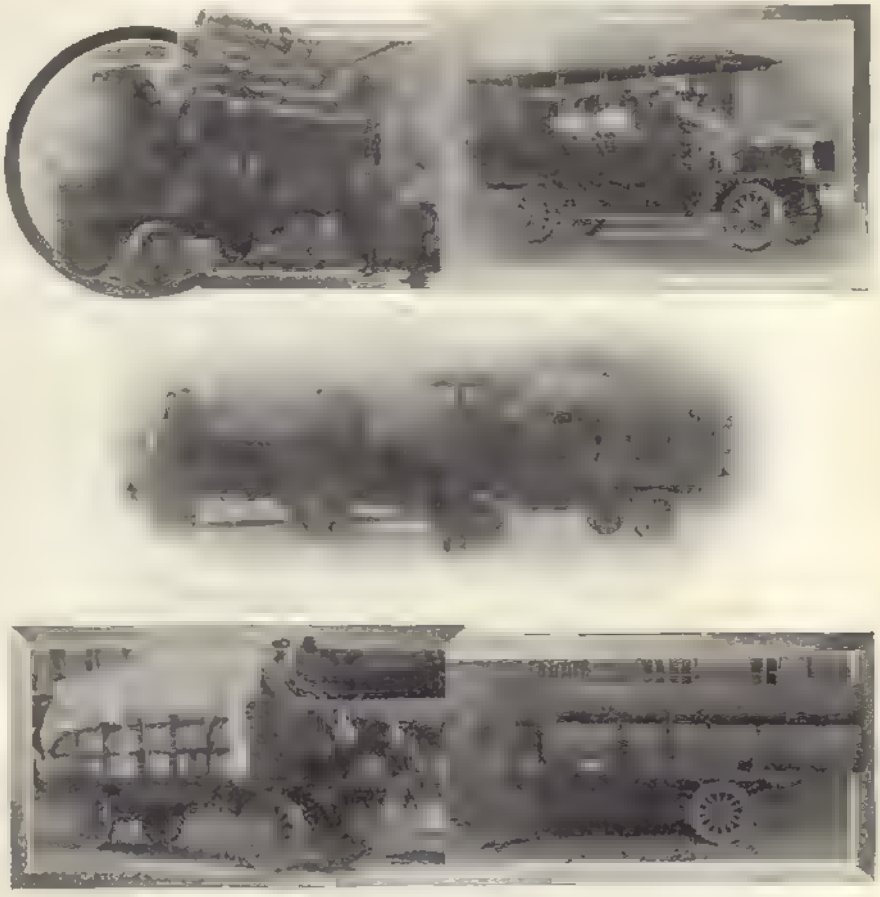
Member of the American Motor Car Manufacturers' Association

Will exhibit in New York only at Grand Central Palace Auto Show, opening December 31st.

# "AMERICAN TRUCKS"

are a tried-out proposition

No pioneering for **YOU** to do **WE** have done it



WE MANUFACTURE

DELIVERY WAGONS, TRUCKS, OMNIBUSES, STAGES, SIGHT-SEEING CARS, AMBULANCES and PATROL WAGONS

**4-Cylinder Water Cooled** **High Power—Low Up-keep**

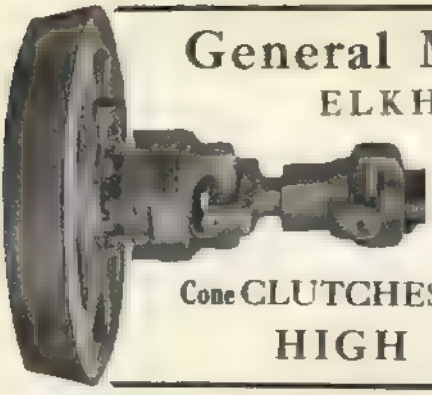
WE MAKE ELECTRIC TRUCKS, TOO

in separate department

Catalogs and specifications on request Address all communications to

**American Motor Truck Co.,** Main Office and Factory Lockport, N. Y., U. S. A.

Branches: NEW YORK CHICAGO SAN FRANCISCO



# General Manufacturing Co.

ELKHART, INDIANA

## Parts Makers

Cone CLUTCHES, TRANSMISSIONS 20 to 50 H.P.

HIGH GRADE WORK

# GRABOWSKY

WE GUARANTEE SERVICE

POWER WAGONS

## The Man and The Car

**The First Car in the World Built on the Quick Detachable Independent Unit Basis, Which Insures Uninterrupted Service and Low Cost of Maintenance**

The latest production of Max Grabowsky, the pioneer commercial car designer of America. There are more cars of Max Grabowsky's design in actual service than any other type of commercial car in the country

**TO THE BUSINESS MAN**

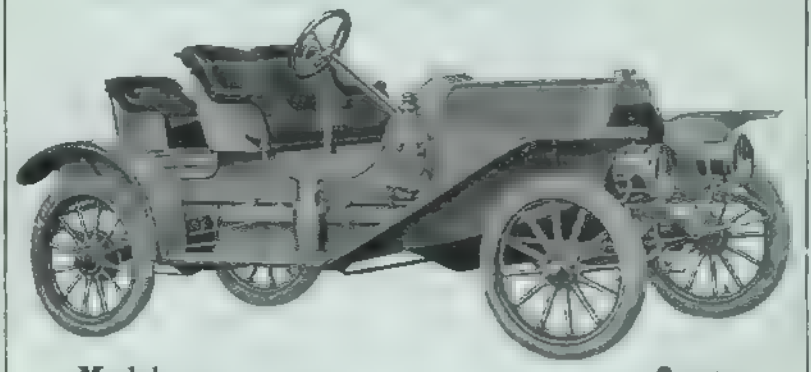
We have organized an Expert Service Bureau, and will gladly advise any business man, without charge, regarding the actual saving he can make by using power wagons either for delivery or passenger work. Valuable experience is at your disposal. WRITE TO-DAY OUTLINING YOUR NEEDS

**GRABOWSKY POWER WAGON CO. SERVICE BUREAU**

80 CHAMPLAIN STREET Standard Manufacturers, A. M. C. M. A. DETROIT, MICHIGAN

**We will Exhibit in New York, only at Grand Central Palace Auto Show, opening Dec. 31st.**

# The Overland



Model 30 - - - - - $1250
With Double Bucket Seats in rear - $1300

4 cylinder 30 H. P.
108" Wheel Base 32 x 3½ Q. D. Tires
Magneto and Headlights

Unquestionably the best value ever placed on the American market

Write for Catalog to

Overland Automobile Co.
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The Overland

For Reliability
For Simplicity
For Comfort
For Noiselessness
For Ease in
Operation and
For Value

The Overland is unexcelled

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# Pickard

MANUFACTURERS

**FOUR MODELS**

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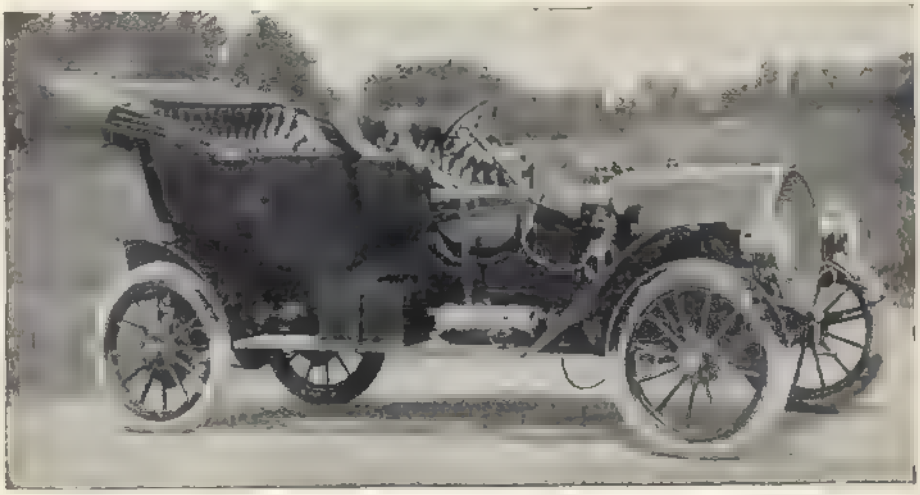
|---|---|
| 5-passenger Touring Car - | $1500 |
| 4-passenger Touring Car - | 1450 |
| 3-passenger Roadster - - | 1400 |
| 2-passenger Runabout - | 1400 |

PICKARD CARS are practical cars for practical people. They are simple in construction, free from delicate mechanical devices and economical in both fuel and oil consumption. They are thoroughly up to date and have a full equipment of clock, speedometer robe rail, foot rail, two gas lamps, generator, three oil lamps, a horn, and two large tool boxes.

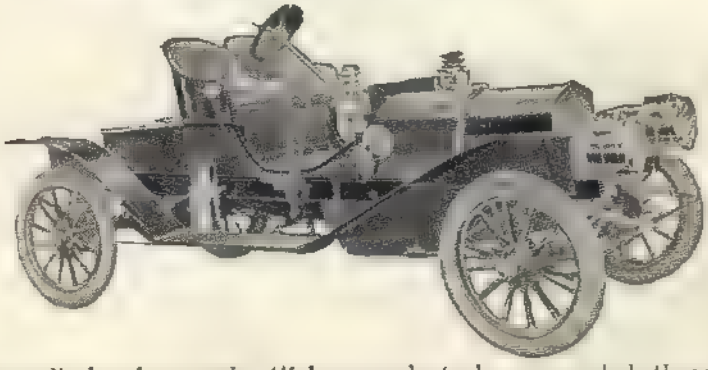


THE PICKARD is a big money-maker for Agents. Write for our interesting proposition.

**PICKARD BROS., Brockton, Mass.**

# MIDDLEBY

## $850.00 RUNABOUT



Four cylinder, four cycle, 4″ bore and stroke, air cooled, three speeds forward and one reverse, slide gear transmission, shaft drive, 108″ wheel base, 30 x 3½ inch tires, complete with two gas lamps and generator, two side oil lamps and one rear lamp, French horn, tube and tools.

**Agents write for territory and catalogue**

**MIDDLEBY AUTO COMPANY, Reading, Pa.**

# The Rapid Agency Proposition

**12-Passenger Pullman**

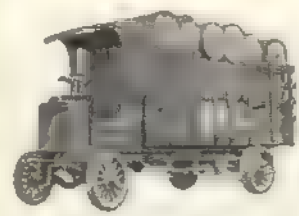
For the profitable business of sight-seeing, hotel, work, summer and winter resort work, etc.

**1-Ton Open Job**

For all kinds of carting purposes.

**1-Ton Panel Job**

Suitable for dry goods, and general delivery work.



**The 5-Ton Truck**

Built in 3, 4, 5 and 6-ton sizes suitable for flour mills, coal companies and any line of business requiring a heavy-duty power wagon.

We want agents—hustling business getters—men with financial backing—not chauffeurs or demonstrators—and to the one in each locality who secures the agency for Rapid Commercial Power Wagons, we will put behind him one of the greatest selling and advertising campaigns ever put behind any commercial power wagon proposition.

More money, more new plans, more legitimate aids will be given the agent for

**Rapid Commercial Power Wagons**

than ever before.

Write today for our agency proposition.

The Rapid Line for 1909 comprises models ranging from 1,000 pounds up to six tons, as follows: Rapid Commercial Power Wagons for any line of business in ½, 1, 1½, 2, 3, 4, 5 and 6-ton sizes.

Motive power: engines of the two cylinder opposed 24 to 30-H. P. type, up to four cylinders, 60-H. P., vertical, heavy duty motors.

The Rapid line for 1909 offers the largest selection of models ever manufactured.

We have spent over a quarter-million dollars to bring Rapid Commercial Power Wagons up to their present state of perfection and efficiency.

A word about the Rapid Motor Vehicle Company: It is the largest and oldest in the commercial car business—and makes nothing but Rapid Commercial Power Wagons, which are "BUILT FOR BUSINESS."

The agent who "ties up" to our organization gets backing which means a great deal, not only in influence, but in protection and fair treatment; a factory which can stand back of its product with a guarantee that means just what it says and a factory which helps its agents in every way possible.

Just to remind you—write today.

See us at the New York, Boston and Chicago Shows.

**RAPID MOTOR VEHICLE COMPANY**

**509 Rapid Street, Pontiac, Michigan, U. S. A.**

Members American Motor Car Manufacturers Association.

# AUTOMOBILE and BICYCLE TAPE

As the largest manufacturers of friction tape for electrical purposes we solicit the business of the Automobile and Bicycle trade for Walpole Insulation and Tire Tape.

Its adhesiveness and strength are long-lived—guaranteed for one year, and rolls now three years old are fresh and "live."

Made by Electrical tape manufacturers, its insulating properties are quite different from ordinary Bicycle or Automobile tape, a point worthy of consideration when the taping of ignition connections is required.

Write for sample rolls and prices.

**Massachusetts Chemical Co.**

Sole Factors
WALPOLE RUBBER WORKS
WALPOLE VARNISH WORKS
ELECTRIC INSULATION LABORATORY

**Walpole, Mass.**

THE finish and appearance of an Electric Vehicle counts much, but the important parts are down where they cannot be readily seen

# RAUCH & LANG ELECTRICS

are the handsomest machines on the market and we can convince you they are the best if you will allow us to take one apart and explain its machinery to you.

Our 1909 model four passenger coupe, operated from the inside, is the most comfortable and convenient motor for city and suburban use. Easily operated by woman or child.

Secure the gratitude of your wife or daughter by purchasing one of our superb Electrics for Christmas. Visit one of the following salesrooms or write for catalog describing and illustrating our eleven models. See our exhibits at New York and Chicago Auto Shows.

## THE RAUCH & LANG CARRIAGE CO.

FIFTY-FIVE YEARS' EXPERIENCE BUILDING FINE CARRIAGES

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**SALESROOMS**

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DETROIT, MICH., Wm. P. V. Neumann & Co., 1342 Woodward Ave.
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TOLEDO, OHIO, Toledo Motor Car Co.
DAVENPORT, IOWA, Mason Carriage Co.
MANCHESTER, N. H., Jas. A. Wellman, Pembroke Building.
ERIE, PA., A. B. Murphy, 918 State St.
OMAHA, NEB., J. J. Dwight & Co., 60 Farnam Ave.
PHILADELPHIA, Pa., Bergdoll Motor Car Co.
COUNCIL BLUFFS, IOWA, L. M. Van Camp, 614 West Broadway.
CANTON, O., Diebold Motor Car Co.
LIMA, O., Wm. E. Rudy.
DENVER, COLO., Auburn Auto Co., 16th and California Aves.
KANSAS CITY, MO., Chandler-Cleveland Motor Car Co.
BALTIMORE, MD., Hotel Garage, North and Madison Aves.
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POUGHKEEPSIE, N. Y., Adam, Meldrum & Anderson Co., So. Union and Court Sts.
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MANSFIELD, OHIO, H. H. Coon, 25 St. Clair Building.
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ATLANTA, GA., M. Rich.
CINCINNATI, O., Hoscheds Motor Car Co.
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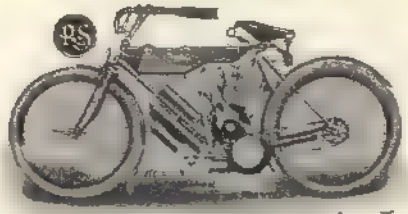
*Reliable dealers wanted to represent us in cities where we have no agents.*

R-S
MOTOR CYCLES



# "R-S" Motorcycles

(AMERICA'S BEST)

THE first and only real Mechanical Intake Valve Motorcycle made and marketed in the United States. Thousands in successful use. The only Motorcycle to climb Pike's Peak. Full of practical features and improvements.

The "R-S" line comprises Single and Twin Cylinder machines, Tandems, Tricycles, Tri-Cars and Delivery Vans, and represents the most value as well as the most advanced motorcycle construction.

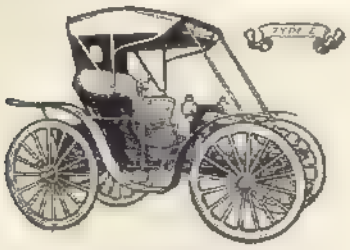
Hundreds of testimonials from every part of United States showing "R-S" achievements in racing, record making, hill climbing and endurance tests sent FREE with complete illustrated catalogue.

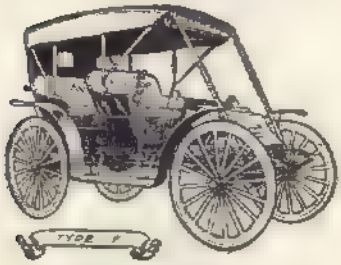
## Reading Standard Company

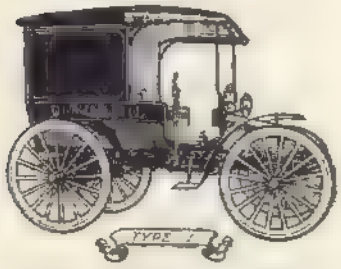
READING, PA.

Makers of the Renowned Reading Standard Bicycles

# The Reliable Dayton Line







## THE RELIABLE DAYTON HAS MADE GOOD

**DEALERS:**

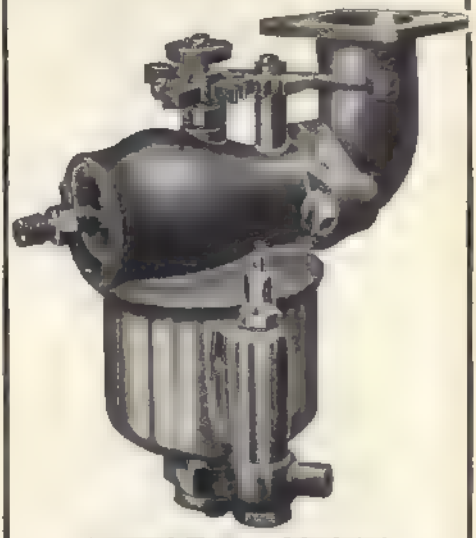
It is not a $75 buggy with a $50 motor in it, but it is a **motor car** from the ground up. It is making business for itself in every territory it invades, through its economical features, compared with the pneumatic-tired car.

Let us refer you to several of the country's large dealers, who have handled the Reliable Dayton the past year. Let them tell you their experience. Investigate; get the *facts*.

Drop us a line to-day for our agency proposition and catalog.

**Reliable Dayton Motor Car Co.**
**Dept. 6 Chicago, Ill.**

# BUICK TYPE



## Special Types, Model C

These special types of our Model C are giving the best of results; some have used four different makes before trying ours, and are now getting results never obtained before.

They give the maximum power on hills, or racing, fine throttle control, easy starting, and save gasoline.

Guaranteed to give satisfaction, or price refunded.

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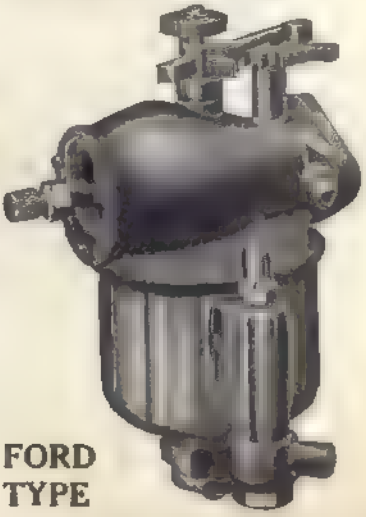


**FORD TYPE**

# B. T. K. PARTS

**Manufactured by**

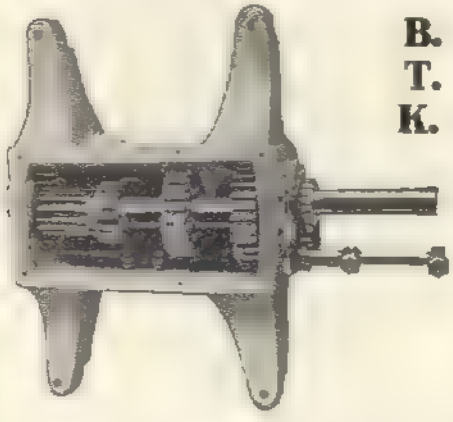
## Auto Parts Manufacturing Company

The best automobile parts for the man who is particular. Our aim is to make high class work in every particular. We make special parts according to your blue prints, and would be pleased to have you submit same for quotations.

## B. T. K. JOINTS

Can't be beat, and will stand up under any load, are dust and fool proof, self oiling, and furnished for shafts in sizes from ¾ to 1¼".

Our progressive and selective side levers are made of drop forgings and best grade of material throughout, and are giving entire satisfaction.

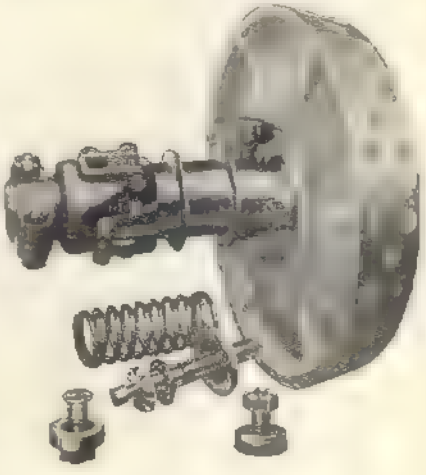


**B. T. K.**

Our worm steering device for heavy cars and our light steering device for light cars and high wheel autos are both durable and what the trade demands

We are making both selective and progressive type sliding gear transmissions, of high class workmanship and material throughout, furnished either leather or bronze face, with or without cork inserts.

We solicit your inquiries, and would be pleased to quote prices on application. Write for price-list and catalogue. For further information address

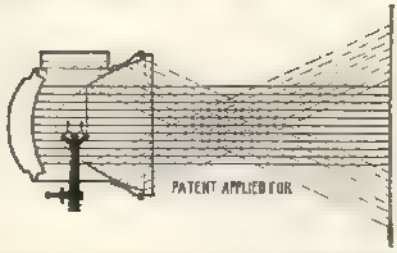


## Auto Parts Manufacturing Company
MUNCIE, IND.

The Neverout

TRADE MARK

# Double Focus Searchlight




TWICE AS POWERFUL AS THE OLD-FASHIONED KIND.

SEE Neverout EXHIBIT MADISON SQUARE GARDEN SHOW N. Y.

The Neverout

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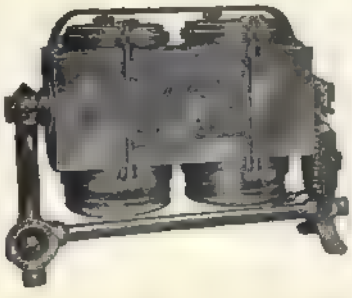

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Generates the purest Acetylene Gas for lighting Autos and Motor Boats. Absolutely overcomes generator troubles. Makes the old style gas tank a thing of the past.

*Write today.*

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(3 Sizes)

THE ORIGINAL

DIETZ MOTOR CAR LAMPS

NONE "JUST AS GOOD"

KEROSENE OIL

ACETYLENE GAS

AND

ELECTRIC CURRENT

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(Acetylene or Electric)

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DIETZ
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DIETZ "Royal Junior" Lamp.

DIETZ "Comet" (Interchangeable) Burner
Fits any Dietz Oil Lamp

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| ELECTRIC HEADLIGHTS | SELF-CONTAINED Acetylene LAMPS | TAXICAB LAMPS |
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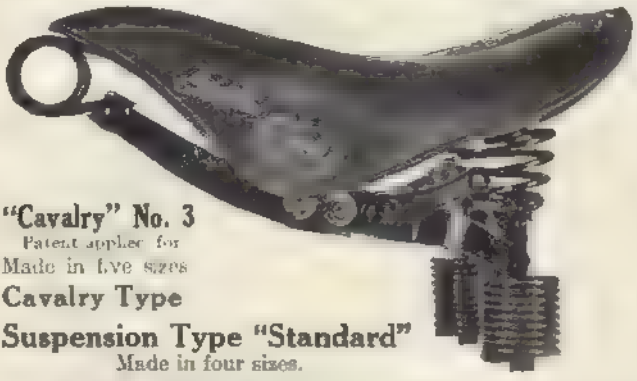
| ACETYLENE SEARCHLIGHTS | OIL, GAS AND ELECTRIC LAMPS | MARINE SEARCHLIGHTS |

*Do not fail to visit our Superb Exhibit at New York and Chicago Shows*

# 1909 MESINGER MOTORCYCLE SADDLES

fitted with **Shock Absorbers** which **check** the **rebound,** prevent **sideplay** and **breakage** and is absolutely noiseless.



**"Cavalry" No. 3**
Patent applied for
Made in five sizes
**Cavalry Type**

**Suspension Type "Standard"**
Made in four sizes.

Mesinger Cavalry No. 3 has the proper shape for a Motorcycle Saddle; made like a horseback saddle, to hold the rider in his original comfortable position

Complete catalogue of Saddles, etc., on application

Mesinger Saddles cost no more than the ordinary kinds. Specify them when you order your new mount.

**No motorcyclist** will ride another's a little after he has tried a Mesinger 1909 fitted with Shock Absorbers.

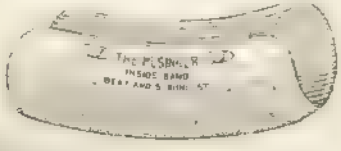
## The Mesinger Tire Repair Bands

### Inside Tire Band

**Guaranteed to wear satisfactory to the consumer,** are standard articles and for sale by all jobbers and dealers of Automobile Accessories

Our Inside Tire Repair Band is made of India Rubber strong fabric, has beveled edges and is moulded to fit the inside of Clincher, Dunlop or Fisk Tires. The hooks can be bent to fit the different styles of casings to prevent creeping.

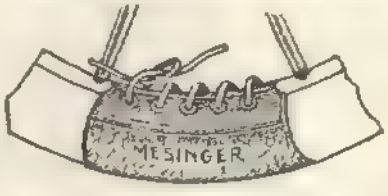
This thoroughly tested Repair Band is made exactly on the same principle as the inside of a Regular Tire, and repairs **blowouts, rimcuts** and other defects of the casing.



| Size | Price |
|---|---|
| 2 & 2½ inches | $1 60 |
| 3 & 3½ " | 2 00 |
| 4 & 4½ " | 2.50 |
| 5 & 5½ " | 3 00 |

### Outside Tire Repair Band

This tire band is made of **Mineral Chrome** tanned leather, which wears like rubber, is tough, soft and pliable, water does not affect it.




| Size | Price |
|---|---|
| 2½ inches | $ 85 |
| 3 " | 1 00 |
| 3½ " | 1 20 |
| 4 " | 1.40 |
| 4½ " | 1 60 |
| 5 " | 1 80 |

Ready to attach to the tire.

**Sold by all Jobbers and Dealers**

**We Will Exhibit at Madison Square Garden, Space 549, Motorcycle Section**

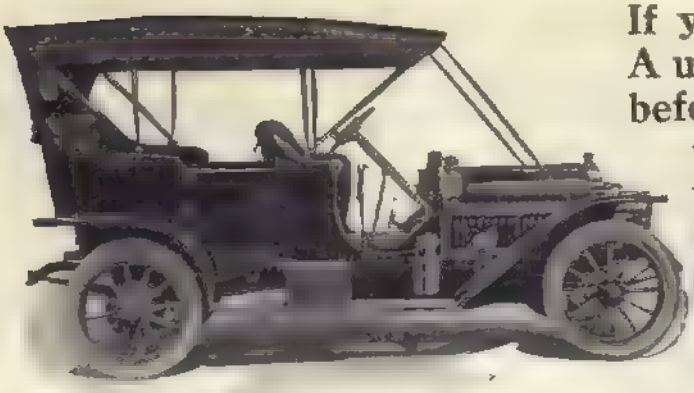
**We Warn the Trade and Consumers Against the Use of Raw Hide Tire Bands. They Burn and Ruin the Tread of the Tire**

## H. & F. MESINGER MFG. COMPANY

**Manufacturers of**

**Automobile Leather Specialties, Bicycle and Motorcycle Saddles**

**1801 & 1803 FIRST AVENUE, NEW YORK CITY**



## If you order any Automobile before you look at the Speedwell, you make a mistake

Not because WE say so, but because the Speedwell is such extraordinary value for the money that you cannot afford to miss such an opportunity It is a big, broad, roomy comfortable car, so exquisitely finished that no other car at any price near it, excels this car in appearance. In construction, few other cars equal it and those that do, sell for a thousand to two thousand dollars more

No other manufacturer is willing to give so much at such a modest price. From the radiator to the rear axle, inch by inch, part by part, will be found the best material that money can buy or experience can produce.

## The 1909 Speedwell

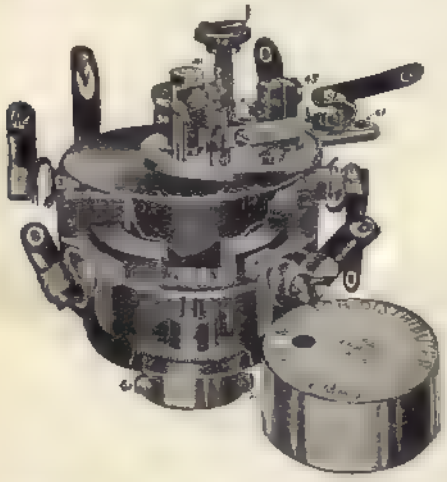
**Price, $2,500**

Fully equipped, 40-45 Horse Power. Four individual cylinders. 120-inch Wheel Base, 58-inch tread.

**THE SPEEDWELL MOTOR CAR CO.**
**DAYTON, OHIO**

Exhibiting at the New York and Chicago Shows. GOOD agents who can handle a GOOD car can secure GOOD territories

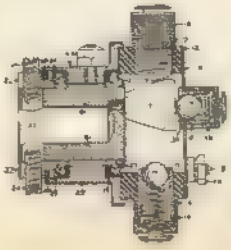
## Monitor Distributer



## ALL PERFECT

## BEMUS TIMER

## Ball Bearing Timer



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PRECISION

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New
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No
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Stays Right
30 Days' Trial

**Stewart Machine Works**

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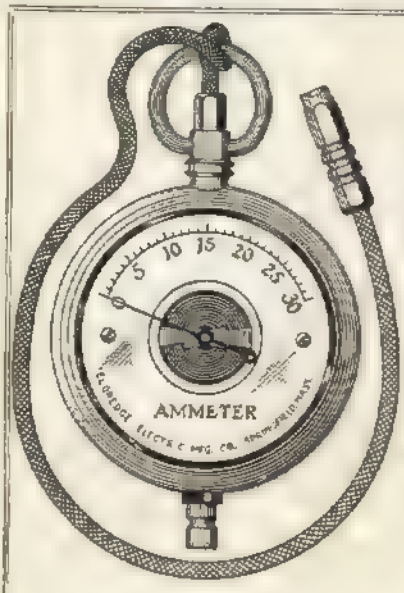


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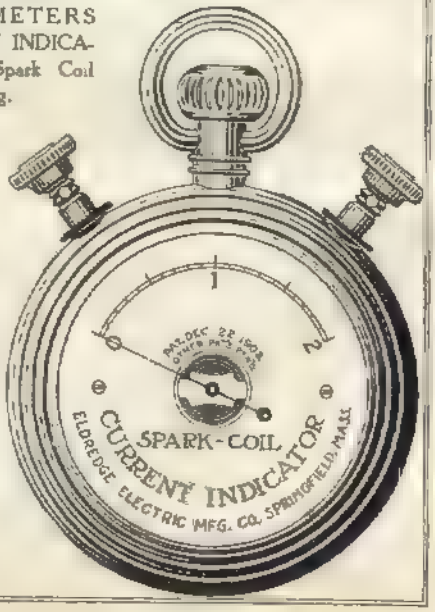
Largest Makers in U S A

Sold by Jobbers and Dealers

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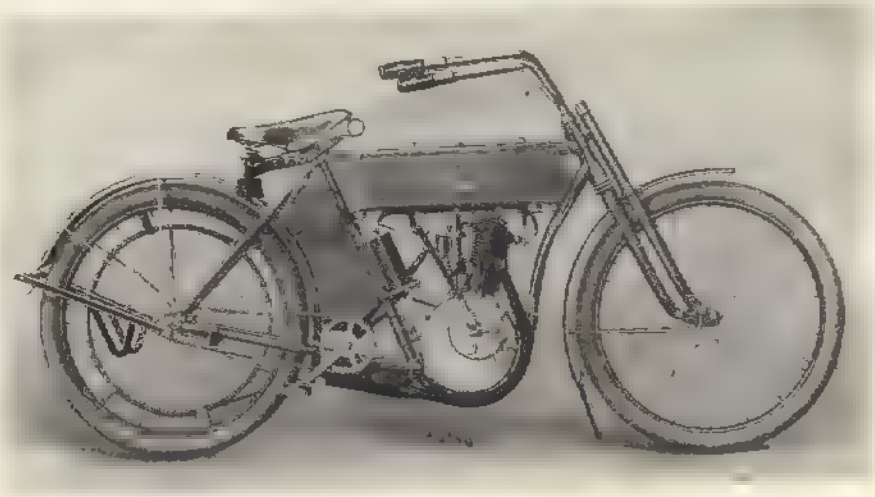

**The Real 1909 Sensation—4 H. P.—$210**

Double bar frame, positive double grip control, attached stand, and a host of other good points. Send for Catalog "E"

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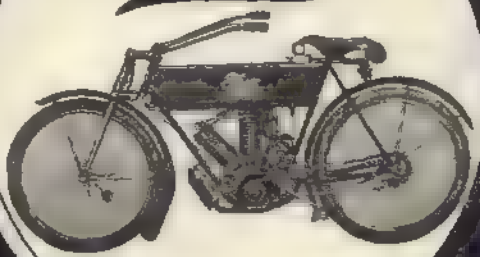

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Motorcycle SUPREME

IS the KEY that Unlocks the Door TO

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For the Motorcycle Dealer or Rider

Ask for Catalog 9
It Tells the Story

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Will exhibit at Madison Square Garden Automobile Show, January 16 to 23. Space 531.

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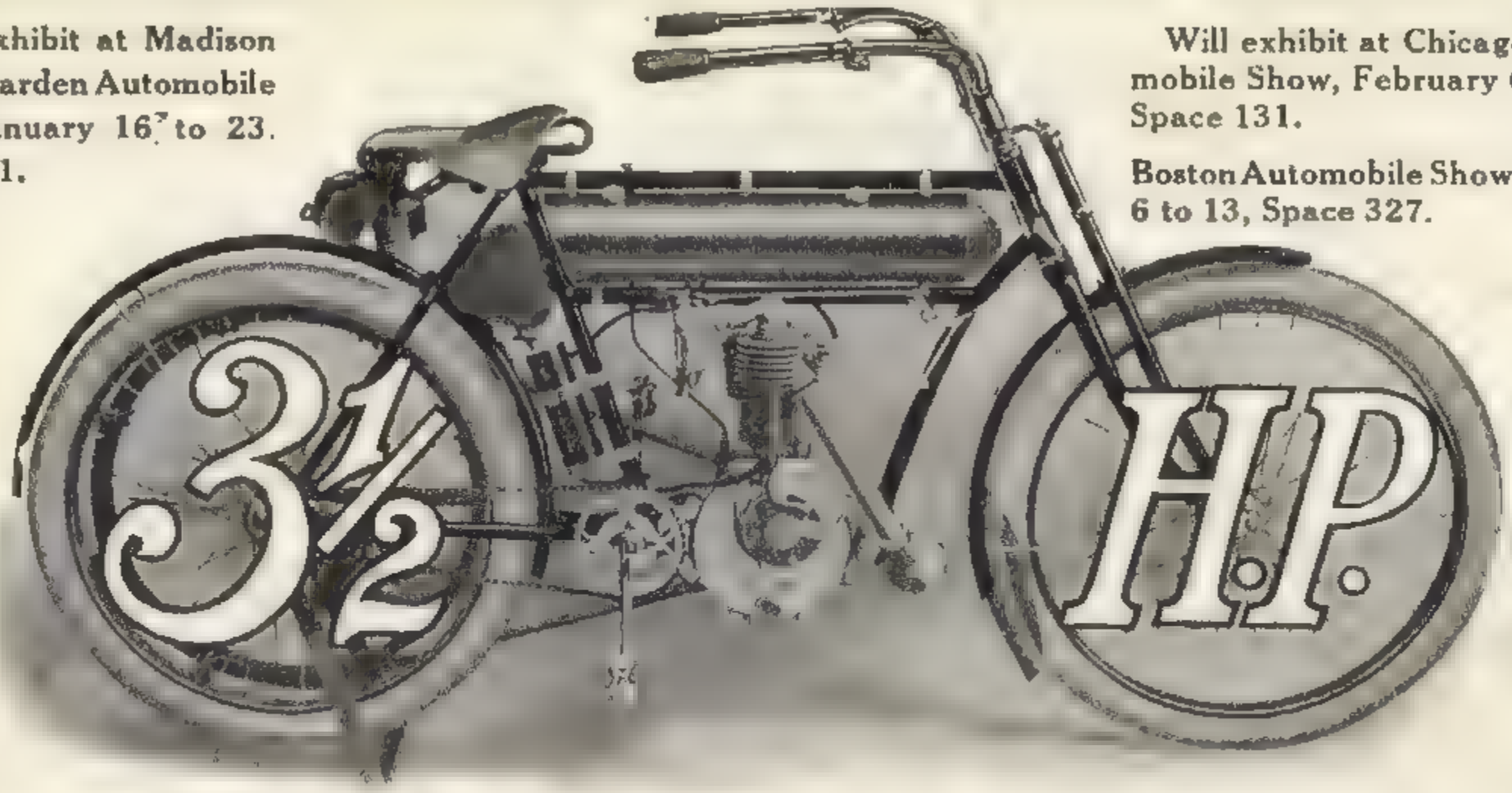


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***Made for men with good red blood***

**An American betterment of the finest foreign models. Easy running, powerful, reliable, swift. Its equal at the price does not exist today.**

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# Pressed Steel Step Hangers

## Two Types

Over Two Dozen Different Drops and Extensions
No Machining Necessary
Prompt Delivery Prices Right

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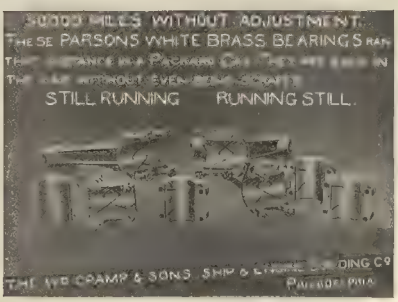


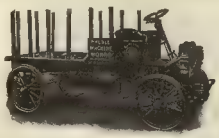

Applications for Agencies in unassigned territory considered.

The STRENUOUS RANDOLPH

A live proposition from every point of view. Built in capacities ranging from 1500 lbs. to 5 tons.

RANDOLPH MOTOR CAR CO.
175 E. RANDOLPH ST., CHICAGO, U. S. A.

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LIGHT DELIVERY

2 Ton 3 Ton
5 Ton 10 Ton

*4 Years' Experience*

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The "World's Best" Commercial Cars. In power and reliability, in strength, simplicity and efficiency, unequaled by any.
Three styles of chassis, ranging from $1600 to $3200. All styles of bodies Write for particulars.

**The Gramm-Logan Motor Car Co.**
Bowling Green, Ohio

**Cheaper to maintain than horses and will do more than double the amount of work.**

## The Chase Motor Wagon

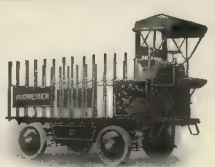
with its **wonderfully simple, air cooled, valveless** motor, high wheels, solid tires and enclosed planetary transmission is the most practical business wagon on the market—because it is dependable for every day service—is economical to maintain and simple to handle.

**Prices, $750, $900, $1050**

Our 1910 line includes the best high wheel Surrey ever built.

**Proofs and Catalogue Mailed on Request**

**CHASE MOTOR TRUCK CO.**
**Syracuse, N. Y., U. S. A.**



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**Battery or Engine Propelled**
**Copper & Steel Construction**

Negotiates any road conditions.
Agents Wanted. Send for catalogue.

**Address Couple Gear Freight Wheel Company**
**560 Buchanan St, Grand Rapids Mich.**

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IS THE ISSUE WHICH WILL BE DISTRIBUTED AT THE

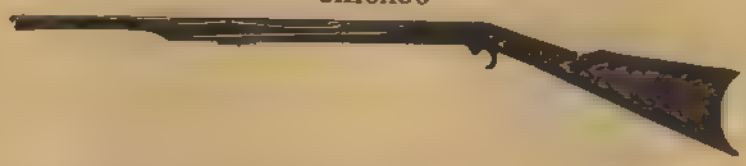
## Atlanta Show
**November 6th to 13th, 1909**

¶ The first week in November there will be held in Atlanta, Ga., a National Automobile show under the auspices of the N. A. A. M. This is the first time in automobile history that a show of national importance has been held in a Southern city, and the interest it will arouse will be widespread over this section of the country. *The November issue of the Journal will have a large distribution at the Atlanta Show.* Here's your chance to make a strong talk to the thousands of visitors to the exhibition and interest prospective buyers of your product. Such a new and fertile field deserves cultivating to the fullest extent, and a bold announcement in the November issue will undoubtedly result in a sure harvest of orders. Make your space reservation early.

**Chilton Printing Co.,** Market & 49th Streets PHILADELPHIA

# Air Rifles

## CHICAGO



**Chicago Single Shot**–All Wood. Handles B. B. and Air Rifle Shot . . . . . Per Doz. $15 00

One Doz. in a Case. Weight, 28 lbs.

## DAISY

No.

**2-Daisy Single Shot** Walnut Stock, Nickel Plated Frame and Barrel, Handles Air Rifle and B B Shot and Darts . . . . . Per Doz. $15.00

One Doz. in a Case. Weight, 28 lbs.

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No.

**30-Daisy 500 Shot**–Walnut Stock Nickel Plated Frame and Barrel, Lever Action, Shoots 500 Times without Reloading, Handles B. B. and Air Rifle Shot. . . . . Per Doz. $27.00

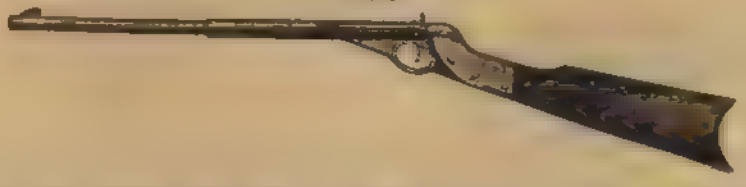
One-half Doz. in a Case Weight, 22 lbs.

**3- Daisy 1,000 Shot**–Same as 500 Shot, but Shoots 1,000 Times without Reloading . . . . . 33 00

**B3-Daisy**–Same as 1000 Shot but Blued . . . . . 39 00

One Half Doz. in a Case Weight 28 lbs.

## KING



No.

**1K-King Single Shot**–Walnut Stock, Nickel Plated Frame and Barrel, Handles B. B and Air Rifle Shot and Darts . . Per Doz. $15 00

**2K-King 350 Shot**–Same as Single Shot, with Magazine which holds 350 B. B. and Air Rifle Shot . . . . . 19 50

One Doz. in a Case. Weight, 28½ lbs.

## BENJAMIN

Pneumatic Air Rifle, operated by filling air chamber with a few strokes of the pump lever. Gives great penetration and accuracy . . . . . Per Doz. $30.00

Weight, about two pounds, length, 37 inches

## DARTS

Assorted Colors for Daisy and King Rifles . . . . . Per Doz. $ 0.75

**CHILTONN ADVERTISING POST CARDS**

**IN NATURAL COLORS**

which are giving their users continuous publicity, bringing results daily and saving postage. No matter what your business, send us your catalog and we will submit a post card campaign which will bring you results.

**CHILTONN PRINTING COMPANY**

**Market and 49th Streets** **Philadelphia, Pa.**

# Combination Pocket Knives

CLEAN CUT

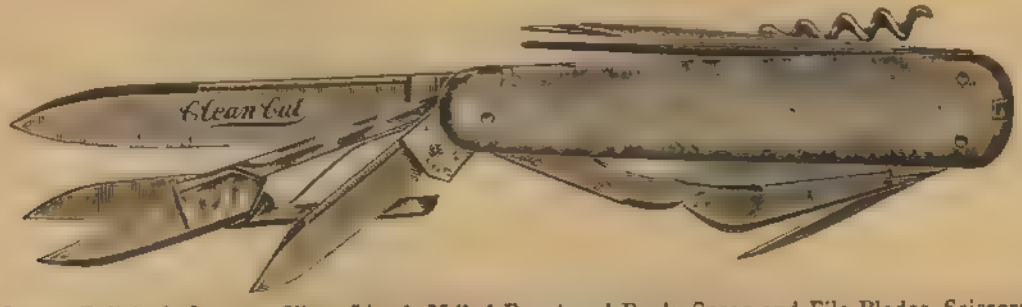
Warranted

Ten Blade, Crocus Polished, German Silver Lined and Shield, Milled Front and Back, Spear and File Blades, Scissors, Cork Screw, Awl, Tweezers and Shell Tooth Pick

| No. | | Per Doz. |
|---|---|---|
| 10099–2¾ in. | Pearl Handle | $55.00 |

Eleven Blade, Crocus Polished, German Silver Lined, Milled Front and Back, Spear and File Blades, Scissors, Cork Screw, Tweezers and Shell Tooth Pick

| No. | | Per Doz. |
|---|---|---|
| 11099–2¾ in. | Pearl Handle | $60.00 |




Twelve Blade, Crocus Polished, German Silver Lined, Milled Front and Back, Spear and File Blades, Scissors, Cork Screw, Awl, Tweezers and Shell Tooth Pick

| No. | | Per Doz. |
|---|---|---|
| 12099–3¼ in. | Pearl Handle | $75.00 |

Twenty Blade, Crocus Polished, German Silver Lined, Milled Front and Back, Seven Cutting Blades, Scissors, Cork Screw, Nail File, Saw, Awl, Punch, Glove Buttoner, Screw Driver, Needle, Tweezers and Shell Tooth Pick

| No. | | Per Doz. |
|---|---|---|
| 20099–2½ in. | Pearl Handle | $108.00 |

Full Size Cuts, One Key in a Box

# Pocket Knives

## CLEAN CUT

Warranted

Two Blade, Crocus Polished

No. 2015–3 in. Gun Metal Handle ..... Per Doz. $12 00

Three Blade, Crocus Polished

No. 3015–2¾ in. Gun Metal Handle ..... Per Doz. $24 00

Three Blade, Crocus Polished

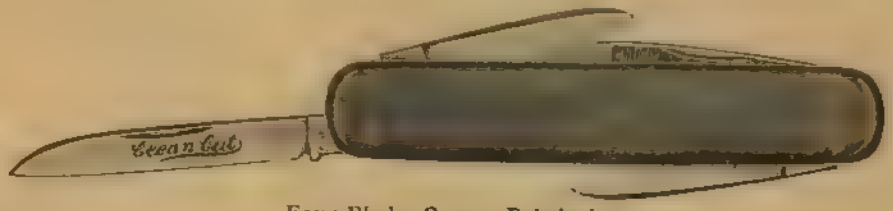
No. 3025–3 in. Gun Metal Handle ..... Per Doz. $24 00

Three Blade, Crocus Polished

No. 3035–3 in. Coppered Metal Handle ..... Per Doz. $24 00

Three Blade, Crocus Polished

No. 3045–3 in. Gun Metal Handle ..... Per Doz. $26 00




Four Blade, Crocus Polished

No. 4025–3 in. Gun Metal Handle ..... Per Doz. $26 00

## Firemens Axes

**Clean Cut Special**
Finest Crucible Steel Pick and Bit
Rustless "Gun Metal" Finish, Handles painted Red

| No. | Per Doz. |
|---|---|
| 29 | $56.00 |

4½ to 6 Pounds, Assorted, One Doz. in a Case

## Ice Axes

Clean Cut

**Clean Cut**
Extra Quality Cast Steel, full Polished
New York Pattern

| No. | Weight | Cut | Per Doz |
|---|---|---|---|
| 59 | 3 lb. | [illegible] | $36 00 |

One Doz. in a Case

## Broad Axes

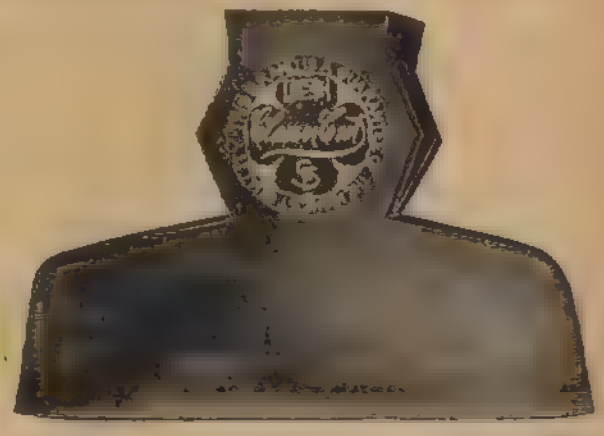
**CLEAN CUT SPECIAL**

Rustless "Gun Metal" Finish, Extra Quality Cast Steel Ground Sharp Ready for Use, Fully Warranted

**Baker Pattern**

| Weight | Cut | Per Doz. |
|---|---|---|
| 5 lb. | 9½ in | $42 00 |
| 5½ " | 10 " | 42 00 |
| 6 " | 10½ " | 42 00 |
| 6½ " | 11 " | 44 00 |
| 7 " | 11½ " | 44 00 |
| 7½ " | 12 " | 46 00 |
| 8 " | 13 " | 46 00 |
| 9 " | 14 " | 48.00 |

One-half Doz. in a Case



**Pittsburgh Pattern**

| Weight | Cut | Per Doz |
|---|---|---|
| 4½ lb | 9½ in | $32 00 |
| 5 " | 10 " | 32 00 |
| 5½ " | 10½ " | 32 00 |
| 6 " | 11 " | 35 00 |
| 7 " | 12 " | 35 00 |
| 8 " | 13 " | 35.00 |

**HUNTS**

Pittsburgh Pattern Cast Steel, Painted Black, Polished Head and Bit

| Weight | Cut | Per Doz. |
|---|---|---|
| 5 lb | 10 in | $32.00 |
| 6 " | 11 " | 32 00 |
| 7 lb. | 12 in | $35 00 |
| 8 " | 13 " | 35.00 |

One-half Doz. in a Case

Clean Cut

# Adzes

HOUSE CARPENTERS

RAILROAD

SHIP CARPENTERS

## CLEAN CUT SPECIAL

Extra Quality Crucible Cast Steel, Rustless "Gun Metal" Finish. Fully Warranted

| No. | | Cut | Per Doz. |
|---|---|---|---|
| 200 | House Carpenters—Assorted | 4 to 4½ in. | $28.00 |
| 201 | Railroad — " | 5 to 5½ in. | 30.00 |
| 202 | Ship Carpenters — " | 4 to 4½ in. | 35.00 |
| 203 | Ship Carpenters, Lipped " | 5 to 5½ in. | 40.00 |

One Doz. in a Case

## RIVERSIDE

Extra Cast Steel, Gold Bronzed, Polished Head and Bit

| No. | | Cut | Per Doz. |
|---|---|---|---|
| 400 | House Carpenters—Assorted | 4 to 4½ in. | $26.00 |
| 401 | Railroad — " | 5 to 5½ in. | 28.00 |
| 402 | Ship — " | 4 to 4½ in. | 33.00 |

One Doz. in a Case

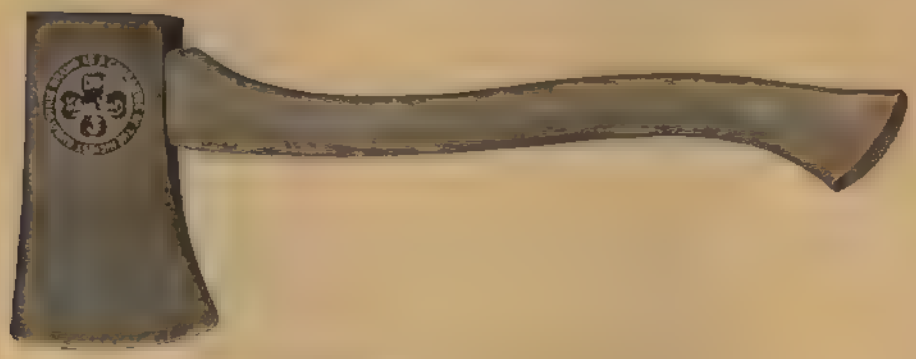
## SUNSET

Superior Quality Cast Steel, Fire Bronzed, Polished Head and Bit

| No. | | Cut | Per Doz. |
|---|---|---|---|
| 601 | Railroad—Assorted | 5 to 5½ in. | $24.00 |

One Doz. in a Case

# Clean Cut House Axes



Rustless Gun Metal Finish Fully Warranted

| No. | | Per Doz. |
|---|---|---|
| $2\frac{1}{2}$ | $2\frac{1}{4}$ lb. Axe, 16 in. Handle | $12.00 |
| 3 | 3 lb. Axe, 18 in. Handle | 15 00 |

# Razors

## CLEAN CUT

Every Razor Guaranteed

Round Black Rubber Handle, Pearl Scaled Tang, Extra Hollow Ground

| No. | | Per Doz |
|---|---|---|
| 42 | Blade ⅝ in., Round Point, Full Crocus Polished, Good Edged | $42.00 |

Full Size Cuts

## BOKER "RED-INJUN"

Fully Guaranteed

Burnt Ivory Celluloid Handle. Special Full Hamburg Ground

| No. | | Per Doz |
|---|---|---|
| 301 | Blade ⅝ in., Round or Square Point | $42.00 |

Round Black Rubber Handle, Full Hamburg Ground

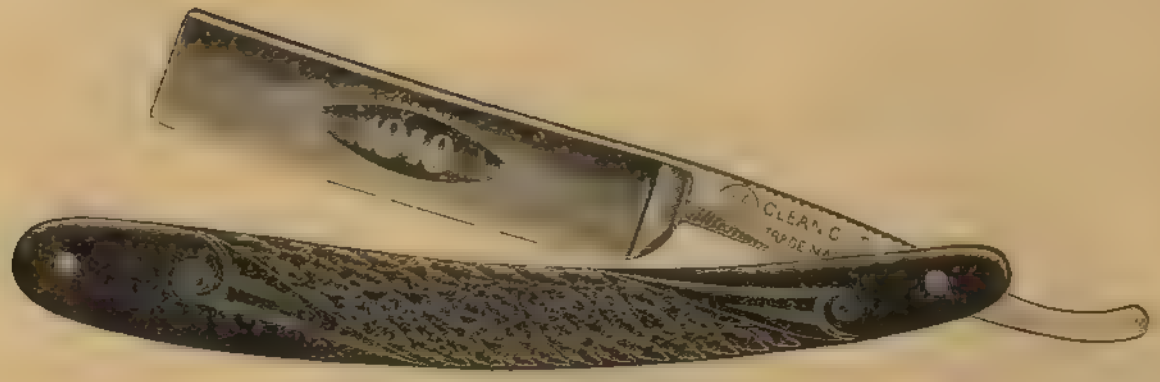
| No. | | Per Doz. |
|---|---|---|
| 100 | Blade ⅝ in., Square Point | $36 00 |
| 101 | Blade, ⅝ in., Square or Round Point | 36 00 |

Cuts Two-thirds Actual Size. All above One half Doz in a Box, Five Box in a Carton

# Razors

CLEAN CUT

Every Razor Guaranteed




**Round Fancy Black Rubber Handle, Full Hollow Ground, Gold Etched**

| No. | | Per Doz. |
|---|---|---|
| **34**–Blade ⅛, ⅜, ⅝ in., Round or Square Point, Full Crocus Polished | | $37 00 |

**Fancy Imitation Shell Handle, Special Hollow Ground, Gold Etched**

| No | | Per Doz |
|---|---|---|
| **35**–Blade ⅝ in., Square Point, Half Crocus Polished | | $36.00 |

**Round Fancy Black Rubber Handle, Hard Rubber Scaled Tang, Extra Hollow Ground**

| No. | | Per Doz |
|---|---|---|
| **40**–Blade ⅝ in., Square Point, Full Crocus Polished | | $36.00 |

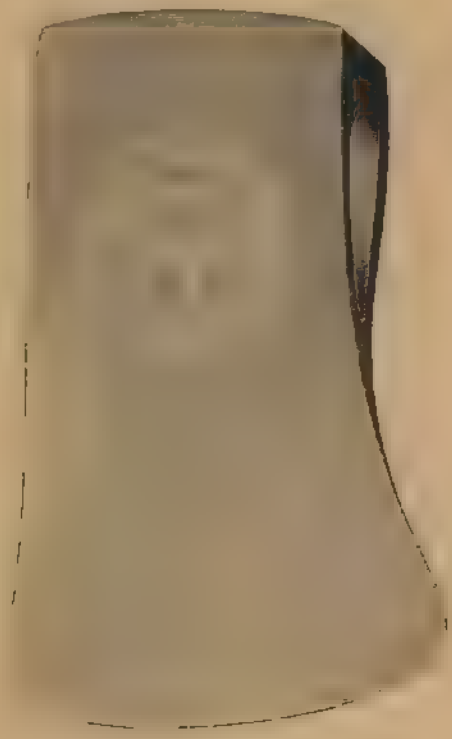
Full Size Cuts, One-half Doz. in a Box. Each in a Carton

# Single Bit Axes

Clean Cut

## CLEAN CUT POLISHED

Michigan Pattern



California-Ohio Pattern

Full Polished and Etched, Extra Quality Silver Steel—Fully Warranted.

### Unhandled

| Michigan Pattern | | California-Ohio Pattern | |
|---|---|---|---|
| No. | Base Per Doz. | No. | Base Per Doz |
| 10 | $16.00 | 15 | $16.00 |

### Handled

| Michigan Pattern | | California-Ohio Pattern | |
|---|---|---|---|
| No. Handles | Base Per Doz. | No. Handles | Base Per Doz. |
| 10 A "Q" | $24 00 | 15 A "Q" | $24.00 |
| 10 C-Sequoia | 23.00 | 15 C Sequoia | 23 00 |
| 10 E-Clinton | 22 00 | 15 E-Clinton | 22.00 |
| 10 F Yosemite | 21 00 | 15 F Yosemite | 21 00 |
| 10 G-Sunset | 20.00 | 15 G-Sunset | 20 00 |
| 10 H-Comstock | 22.00 | 15 H-Comstock | 22.00 |
| 10 K-Extra | 21.00 | 15 K-Extra | 21.00 |
| 10 L-Excelsior | 20.00 | 15 L-Excelsior | 20 00 |
| 10 M-No. 1 | 19.50 | 15 M-No. 1 | 19.50 |

Weights-3, 3½, 4, 4½ and 5 pounds, or Assorted 3 to 4, 3¼ to 3¾, 3½ to 4½ and 4 to 5 pounds

One Doz. in a Case

**For Classification of Advances over Base Prices, See Page 2**

Clean Cut

# Single Bit Axes

## CLEAN CUT SPECIAL

Michigan Pattern

California-Ohio Pattern

Rustless "Gun Metal" Finish, Deep Gold Filled Etching
Extra Quality Crucible Cast Steel—Fully Warranted

### Unhandled

| No. | Michigan Pattern — Base Per Doz. | No. | California-Ohio Pattern — Base Per Doz. |
|---|---|---|---|
| 20 | $15.00 | 25 | $15.00 |

### Handled

| No. | Handles | Michigan Pattern — Base Per Doz. | No. | Handles | California-Ohio Pattern — Base Per Doz. |
|---|---|---|---|---|---|
| 20 | A–"Q" | $23.00 | 25 | A–"Q" | $23.00 |
| 20 | C Sequoia | 22.00 | 25 | C–Sequoia | 22.00 |
| 20 | E Clinton | 21.00 | 25 | E–Clinton | 21.00 |
| 20 | F Yosemite | 20.00 | 25 | F Yosemite | 20 00 |
| 20 | G–Sunset | 19.00 | 25 | G–Sunset | 19.00 |
| 20 | H–Comstock | 21.00 | 25 | H–Comstock | 21.00 |
| 20 | K–Extra | 20.00 | 25 | K–Extra | 20.00 |
| 20 | L–Excelsior | 19.00 | 25 | L–Excelsior | 19.00 |
| 20 | M–No. 1 | 18.50 | 25 | M–No. 1 | 18.50 |

Weights 3, 3½, 4, 4½ and 5 pound or Assorted 3 to 4, 3¼ to 3¾, 3½ to 4½ and 4 to 5 pounds

One Doz. in a Case

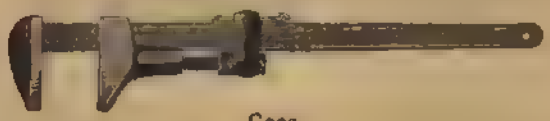
## BARKING PATTERN

Extra thin wide blade–otherwise same as California-Ohio Pattern

| No. | | Per Doz. |
|---|---|---|
| 27– | 3½ lb. Unhandled | $16.00 |
| | 3¾ " " | 16.50 |
| | 4 " " | 16.50 |
| | 3½ to 4½ lbs. Unhandled | 16.50 |

For Classification of Advances over Base Prices, See Page 2

# Key Model Wrenches



Coes

Heavy Steel Forging, Hardened by Special Process, Tested and Fully Warranted

| Length | | |
|---|---|---|
| 28 in. | Takes up to Hexagon Nut Union on 4 in. Pipe. Weight 19 lbs. . . . | $ 9 75 |
| 36 in. | Takes up to Hexagon Nut Union on 5 in. Pipe, Weight 27 lbs . . . | 19 00 |

# Yankee Pipe Jaws

Hardened Tool Steel, Milled Teeth. Converts an Ordinary Screw Wrench into a Perfect Pipe Wrench—Fully Warranted

| No. | | Per Doz. |
|---|---|---|
| 1 | Fits all 12, 15, 18 and 21 in. Screw Wrenches | $ 7.00 |
| 3 | Fits all 6, 8, 10 and 12 in. Screw Wrenches | 6.00 |

One Doz. in a Box

# Pipe Wrenches

GENUINE STILLSON

6 to 14 in. Wood Handle

18 to 48 in. Steel Handle

Drop Forged Tool Steel, Hardened Jaws, Polished

| Length | Holds Pipe | Each | Length | Holds Pipe | Each |
|---|---|---|---|---|---|
| 6 in. | ⅛ to ⅝ in. | $ 2.00 | 18 in. | ¼ to 2 in. | $ 4 00 |
| 8 in. | ⅛ to ¾ in. | 2.00 | 24 in. | ¼ to 2½ in. | 6 00 |
| 10 in. | ⅛ to 1 in. | 2.25 | 36 in. | ⅜ to 3½ in. | 12.00 |
| 14 in. | ⅛ to 1½ in. | 3.00 | 48 in. | ¾ to 5 in. | 18.00 |

6 to 24 in., Six in a Case. 36 and 48 in., Loose

Extra Parts for Stillson Wrenches

| Size Wrench, in | | 6 | 8 | 10 | 14 | 18 | 24 | 36 | 48 |
|---|---|---|---|---|---|---|---|---|---|
| Frames | Each | $ 0.35 | .35 | .40 | .50 | .55 | .80 | 1.30 | 1 50 |
| Jaws | " | .75 | .75 | .80 | 1.00 | 1.33 | 2.10 | 4.75 | 7 25 |
| Nuts | " | .11 | .11 | .14 | .17 | .22 | .35 | .55 | .95 |

GENUINE TRIMO

Drop Forged Tool Steel, Hardened Sliding and Inserted Jaws, Polished

| Length | Holds Pipe | Each | Length | Holds Pipe | Each |
|---|---|---|---|---|---|
| 6 in. | ⅛ to ⅝ in. | $ 2.00 | 18 in. | ¼ to 2 in. | $ 4 00 |
| 8 in. | ⅛ to ¾ in. | 2.00 | 24 in. | ¼ to 2½ in. | 6 00 |
| 10 in. | ⅛ to 1 in. | 2.25 | 36 in. | ½ to 3½ in. | 12 00 |
| 14 in. | ⅛ to 1½ in. | 3 00 | 48 in. | ¾ to 5 in. | 18 00 |

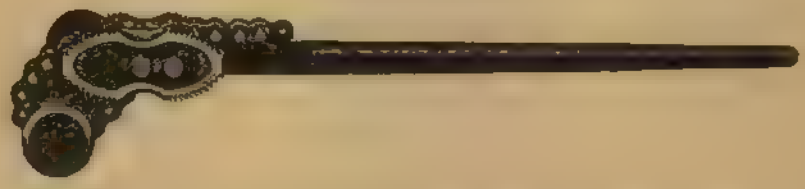
6 to 24 in. Six in a Case. 36 and 48 in., Loose

Extra Parts for Trimo Wrenches

| Size Wrench, in | | 6 | 8 | 10 | 14 | 18 | 24 | 36 | 48 |
|---|---|---|---|---|---|---|---|---|---|
| Frames | Each | $ 0.25 | .25 | .33 | .45 | .55 | .65 | 75 | 1.00 |
| Sliding Jaws | " | .67 | .67 | .75 | 1.00 | 1.33 | 2 00 | 4.00 | 6 00 |
| Inserted Jaws | " | .25 | 25 | .33 | .50 | .55 | .65 | 1.00 | 1.25 |
| Nuts | " | .20 | .20 | .27 | .35 | .42 | .50 | .65 | .80 |

# Chain Pipe Wrenches

## VULCAN BIJAW



**With Flat Link Chain and Double-Ended Reversible Jaws**

The Reversible Jaws can be quickly and easily changed end for end as the teeth become worn, thus doubling the life of the Jaws

Wrought Steel Drop Forged Jaws, with Milled Teeth, Hardened, All Parts Interchangeable—Fully Warranted

| No. | Capacity Pipe | Length over all | Length Chain | Weight | Each |
|---|---|---|---|---|---|
| 30 | ⅛ to ¾ in. | 13¾ in. | 9½ in. | 1¾ lbs | $ 2.50 |
| 31 | ⅛ to 1½ in. | 20 in. | 13½ in. | 5¾ lbs | 3.50 |
| 32 | ¼ to 2½ in. | 27 in. | 17½ in. | 10 lbs | 5.00 |
| 33 | ¾ to 4 in. | 37 in. | 22½ in. | 16 lbs | 7.00 |
| 33½ | 1 to 6 in. | 44½ in. | 31 in. | 24 lbs | 9.00 |
| 34 | 1½ to 8 in. | 50½ in. | 39 in. | 31 lbs | 11.00 |
| 35 | 2 to 12 in. | 64½ in. | 54½ in. | 50 lbs | 18.00 |

**Extra Parts for Vulcan Bijaw Chain Wrenches**

| For Wrench, No. | 30 | 31 | 32 | 33 | 33½ | 34 | 35 |
|---|---|---|---|---|---|---|---|
| Chains, each | $ 0 75 | 1.00 | 1 50 | 2 50 | 3.25 | 4.00 | 6.00 |
| Jaws per Pair | 1 00 | 1 75 | 2 75 | 4 00 | 4.75 | 5.50 | 7.50 |

# Chain Fittings Wrenches

## AGRIPPA

**With Flat Link Chain**

Wrought Steel, Drop Forged Jaw, with Milled Teeth, Hardened. A single, narrow, powerful Jaw for both Pipe and Fittings Gets into tight, narrow places, and bites on irregular shapes. All parts interchangeable—Fully Warranted

| No. | Capacity, Pipe Fittings | Length, over all | Length Chain | Weight | Each. |
|---|---|---|---|---|---|
| 21 | ⅛ to 1½ in. | 20 in. | 15 in. | 5¾ lbs | $ 3.50 |
| 22 | ¼ to 2½ in. | 27 in. | 19½ in. | 9¾ lbs | 5.00 |
| 23 | ¾ to 4 in. | 37 in. | 26 in. | 17 lbs | 7.00 |
| 23½ | 1 to 6 in. | 44½ in. | 34 in. | 24 lbs | 9 00 |
| 24 | 1½ to 8 in. | 50½ in. | 45 in. | 32 lbs | 11.00 |
| 25 | 2 to 12 in. | 64½ in. | 61 in. | 56 lbs | 18.00 |

**Extra Parts for Agrippa Fittings Wrenches**

| For Wrench No. | 21 | 22 | 23 | 23½ | 24 | 25 |
|---|---|---|---|---|---|---|
| Chains, each | $1.25 | 1.75 | 2.75 | 3.75 | 4.50 | 6.75 |
| Jaws, each | 1.75 | 2.75 | 4.00 | 4.75 | 5.50 | 7.50 |

# Component Parts of Savage Automatic Pistol

32 Caliber.

| No. | | Each |
|---|---|---|
| 1G | Frame | $ 8.50 |
| 2G | Bolt | 3.00 |
| 3G | Barrel | 2.00 |
| 4G | Breech Plug | 2.50 |
| 5G | Trigger | .50 |
| 6G | Trigger Spring | .05 |
| 7G | Cocking Lever | .75 |
| 10G | Cocking Lever Pin | .05 |
| 11G | Firing Pin | .35 |
| 12G | Firing Pin Pin | .05 |
| 13G | Firing Pin Spring | .15 |
| 14G | Firing Pin Spring Retainer | .25 |
| 15G | Sear | .25 |
| 16G | Sear Spring | .05 |
| 17G | Sear Trip | .40 |
| 18G | Sear Trip Lifter | .10 |
| 19G | Sear Trip Catch | .25 |

| No. | | Each |
|---|---|---|
| 20G | Sear Trip Catch Spring | $0 05 |
| 21G | Extractor | .25 |
| 22G | Extractor Spring | 05 |
| 23G | Ejector | .25 |
| 24G | Safety | 35 |
| 25G | Retractor Spring | 15 |
| 26G | Magazine Catch | 25 |
| 27G | Magazine Spring | 20 |
| 28G | Magazine | 70 |
| 29G | Magazine Follower | 05 |
| 30G | Magazine Bottom | 05 |
| 31G | Front Sight | 15 |
| 32G | Rear Sight | .20 |
| 33G | Right Stock | .25 |
| 34G | Left Stock | .25 |
| 35G | Magazine Catch Pin | 05 |
| 36G | Magazine Catch Spring | 05 |
| | Magazine Complete Including Spring, Follower and Bottom | 1 00 |

# NO MORE FINES

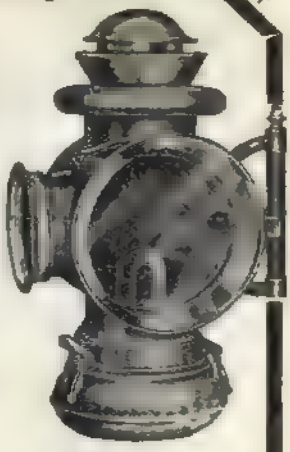
THE BEST TAIL LAMP ON THE MARKET

## For Driving without your Tail Lamp Lit

If you equip your car with one of Ham's, and it will save you a great deal of trouble, annoyance and expense. The Vigilant illustrated herewith, is our most popular tail lamp, it is absolutely wind proof, will not jar out and can be relied upon to stay alight under any and all conditions. Beside the red light for rear signal, it gives a powerful white light, and the rigid handle makes it very handy and convenient for inspecting engine or car in case of a break down. It is fitted with our new Safety Locking Handle, which does away with the constant annoyance of losing your lamp or having it stolen

Write for our new catalogue, it will interest you. Address Dept "D."

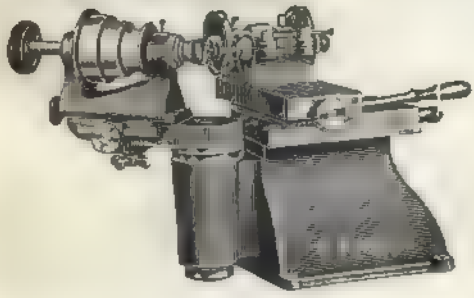
HAM'S NEW SAFETY BRACKET

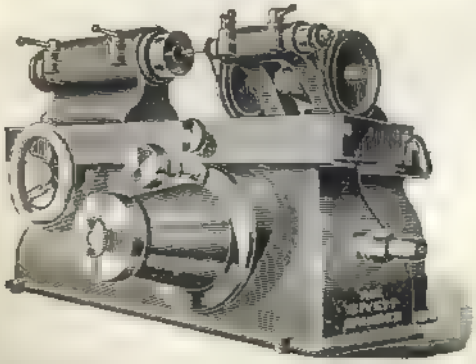


HAM'S VIGILANT TAIL AND INSPECTOR LAMP

## C. T. Ham Manufacturing Co.

ROCHESTER, N. Y.





# RIVETT GRINDERS

We specialize on Grinders for Hole Grinding, Ball Race Grinding and Cam Rolls.

INVESTIGATE

Send for catalog and full information.

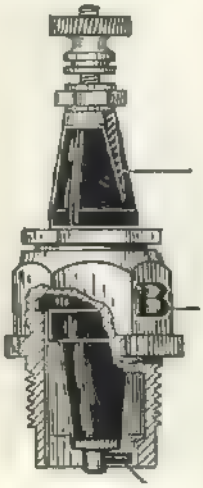
## RIVETT LATHE MFG. CO., Brighton, BOSTON, Mass., U. S. A.

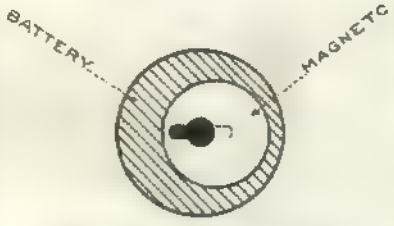
# BUILT ON HONOR
# THE EXCENTRIC

Adjustable Spark Gap

# MICA PLUG

Guaranteed One Year




**"Takes You Home on Weak Batteries"**

CONSTRUCTION—double insulated MICA CORE, will not split, crack or short circuit; spark point rigidly secured to end of core bolt at right angles. Shell bored on excentric adjustment made by loosening bushing and turning core in shell. A safe, sane and sure construction, unbreakable, practically soot-proof

POST PAID, **75c each**

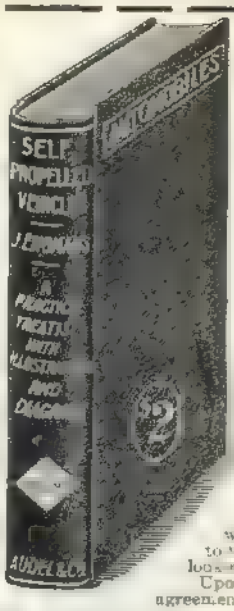
**The Mica Core Mfg. Co.**

Mfrs. of Mica Cores, Spark Plugs, Timers and Distributers

440 East 166th St., New York



# HOW TO RUN AN AUTO




"Homans' Self Propelled Vehicles" gives full information and care in charge and how to overcome trouble.

Beginning at the first principles necessary to be known and going forward to the complete detail of every part of a Motor Car.

It is a thorough course in the Science of Automobiles highly approved by manufacturers, owners, operators and mechanics. Contains over 400 illustrations and diagrams making every detail clear, written in plain language. Handsome cloth binding.

**Price $2, Postpaid**

**SPECIAL OFFER**

The only way the practical merit of this MANUAL can be proven is by an examination of the book itself which we will submit for examination to be paid for or returned, after looking it over.

Upon receipt of the following agreement, the book will be forwarded.

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**Theo. Audel & Co., 63 Fifth Ave., New York**

Kindly mail me copy of HOMANS' AUTOMOBILES and, if found satisfactory, I will immediately remit you $2.00, or return book to you.

NAME .....

ADDRESS .....

Cycle

# GAS ENGINE MANUAL

*These are just published, gas engine tables are most helpful information regarding the construction and care of Gas, Gasoline and Oil Engines, Marine Motors and Automobile Engines, including chapters on Producer Gas Plants and the Alcohol Motor.*

*The book is practically cover to cover and is worth many times the price to any one running a gas engine of any type and size. Contains 1000 pages, 97 chapters, 150 diagrams, size 5½ x 8½ inches, weighs 2 pounds, is also explained in every way a practical engine.*

**SPECIAL OFFER**

*The only way the practical merit of this MANUAL can be guaranteed is by an examination of the book itself, which we will submit to the readers of Trade Journal, free for examination to be paid for or returned, after looking it over.*

Upon receipt of the following agreement (which can be either cut out or copied), the book will be immediately forwarded.

**No money in advance required; sign and return**

**Theo. Audel & Co., 63 Fifth Ave., New York**

Kindly mail me copy of "Audels Gas Engine Manual," and, if found satisfactory, I will immediately remit you $2.00, or return the book to you.

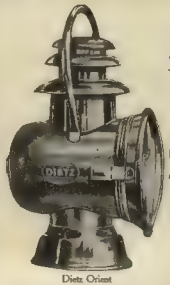
NAME .....

ADDRESS .....

Cycle

DIETZ

MOTOR CAR LAMPS
AND GENERATORS




Dietz Orient

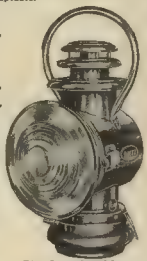
# DIETZ

## "ROUND TYPE" OF SIDE LAMPS FOR MOTOR CARS

**Adapted to use Kerosene, Acetylene and Electricity**

¶ For Large and Small Cars and the widening class of Buggy-Abouts, Surrey-Abouts, etc., they form perfect equipment where the square style is not adaptable.

**READY!**
Latest models of
DIETZ "ROYAL" 15" HIGH
DIETZ "REGAL" 13½" HIGH
DIETZ "IDEAL" 11½" HIGH
DIETZ "ORIENT" 13" HIGH
DIETZ "DAINTY" 12" HIGH



Dietz Orient Optical Lens

**HANDSOME; WELL MADE; GOOD CANDLE POWER; BURN PERFECTLY.**

SEND US YOUR INQUIRIES AND LET US SUBMIT FIGURES

## R. E. DIETZ COMPANY

**60 LAIGHT STREET, NEW YORK CITY**

ESTABLISHED 1840

Our Catalog Shows Lamps for Oil, Gas and Electricity. SEND FOR IT

# Lamps

### DIETZ TUBULAR SQUARE

Japanned Blue

Height 21¼ in. Width 9⅝ in. Depth 10⅛ in. No. 3 Burner, 1⅛ in. Wick, 8 in. Silvered Glass Reflector

| No. | Each |
|---|---|
| 2– | 6 50 |

Gross Weight 21 lbs.
One in a Case

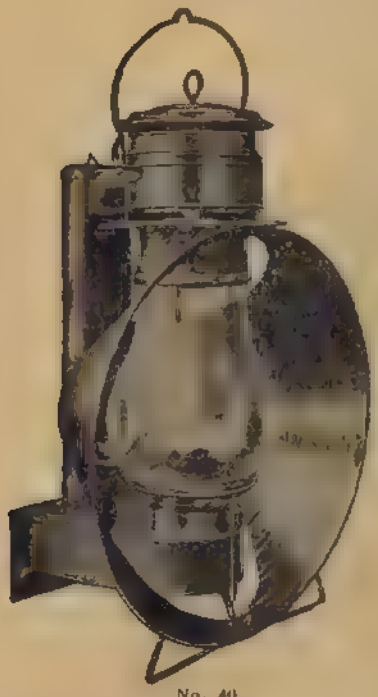
### SQUARE STATION

Japanned Blue

| No. | Each |
|---|---|
| 1–8x10 in. No. 1 Burner, ⅝ in. Wick, 7 in. Glass Reflector, Gross Wt. 12 lbs. | $4.00 |
| 2–10x12 in. No. 2 Burner, 1 in. Wick, 8 in. Glass Reflector, Gross Wt. 16 lbs. | 4.50 |
| 3–11x15½ in. No. 2 Burner, 1 in. Wick, 10 in. Glass Reflector, Gross Wt. 22 lbs. | 5.50 |

One Each in a Case

# Tubular Searchlights

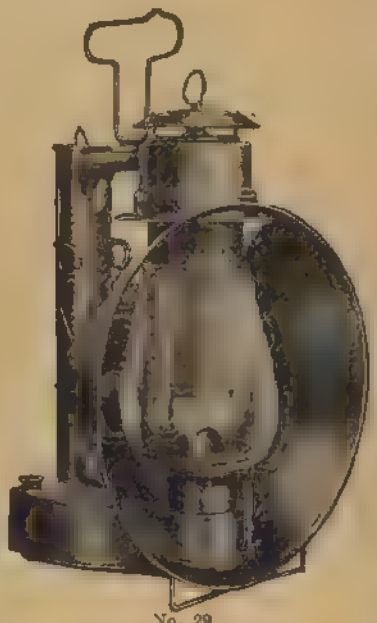


No. 40

Blue Japanned, No. 3 Burner, 1¼ in. Wick, No. 2 Globe, Cold Blast, 8½ in. Deep, 16 in. Brt. Tin Reflector.

| No. | Per Doz. | Each |
|---|---|---|
| 40– | | $6.00 |

Gross Wt. each 25 lbs.
One in a Case



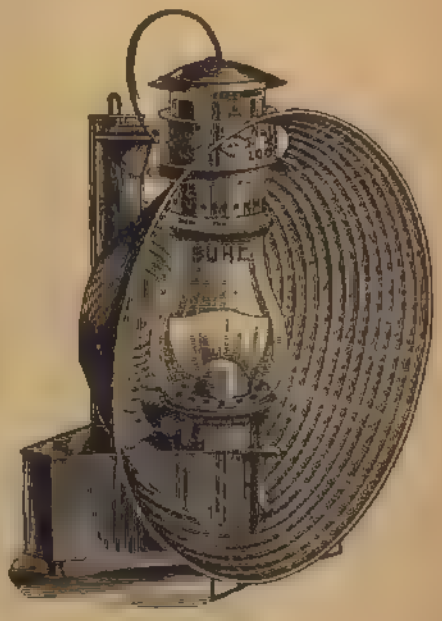
No. 29

Blue Japanned, No. 2 Burner, 1 in. Wick, No. 0 Bulls Eye Globe, 12 in. Brt. Tin Reflector.

| No. | Per Doz. |
|---|---|
| 20– | $30.00 |

Gross Wt. Doz. 96 lbs.
One-half Doz. in a Case

# Buhl Headlight



No. 100

Brown Japanned, No. 2 Burner, 1 in. Wick, No. 0 Globe, 16 in. Reflector.

| No. | Per Doz. |
|---|---|
| 100– | $33.00 |

Gross Wt. each 12 lbs.
One in a Case

# Mill Lamps

Nos. 1 to 8

No. 4

Nos. 9 and 10

**BACK REFLECTOR**

| No. | Each |
|---|---|
| 1–Size Glass, 6x10 in., ⅝ in. Wick, Wt. 3½ lbs | $ 2 00 |
| 2–Size Glass, 8x12 in., 1 in. Wick, Wt. 5 lbs | 2 75 |
| 7–Size Glass, 10x14 in., 1⅛ in. Wick, Wt. 8½ lbs | 3.50 |
| 8–Size Glass, 12x16 in., 1⅛ in. Wick, Wt. 12½ lbs | 4 75 |

**CENTRAL REFLECTOR**

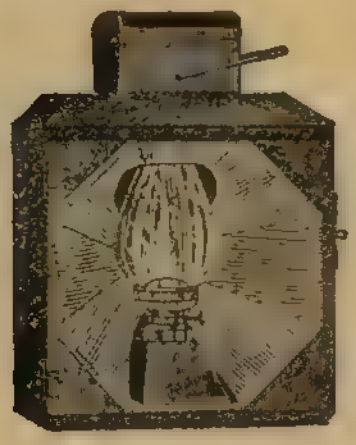
| No. | Each |
|---|---|
| 4–Size Glass, 11x11 in., 1⅛ in. Wick, Wt. 9 lbs | $ 6.00 |

**TRIANGULAR SIDE**

| No. | Each |
|---|---|
| 9–Size Glass, 10x12 in., 1 in. Wick, Wt. 5 lbs | $ 2.75 |
| 10–Size Glass, 12x16 in., 1⅛ in. Wick, Wt. 8½ lbs | 4.00 |

# Headlights

**OCTAGON**



| No. | Each |
|---|---|
| 5–Front Width 12 in. | $ 6.00 |
| 6–Front Width 16 in. | 11.25 |

**LOCOMOTIVE**

| No. | Each |
|---|---|
| 145–14½ in. Lense | $33.00 |
| 170–17 in. Lense | 40.00 |
| 205–20½ in. Lense | 50.00 |
| 240–24 in. Lense | 65.00 |

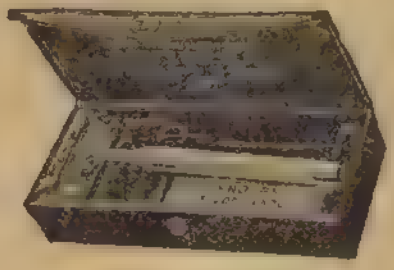
# Safety Razors

## DURHAM-DERBY SAFETY RAZOR

Similar in construction to the Durham Duplex. Made of steel and heavily nickel plated. One-half dozen Durham Duplex blades with razor. This razor is adapted to use the regular Durham Duplex blades.

| | |
|---|---|
| **Durham Derby,** each | $2 50 |
| **Extra Blades,** per dozen (6 [illegible]) | 1 00 |

### ENDERS



Solid Nickel Silver Frame, Steel Handle Heavy Nickel Plated, Length 4 inches with Knurled Center, Each Razor contains seven blades, **Each blade will give from six to twenty shaves,** Hinged case covered with black Karatoi, Purple Silk Plush Lined

| | Each |
|---|---|
| **Enders Razors,** [illegible] | $2 00 |
| Packed one to a box [illegible] | |
| **Enders Blades,** five in sealed package [illegible] | 25 |

# Strops

### DURHAM

Cushion Strop, Oval Sides, Nickel Draw Handle especially adapted for thin wafer safety razor blade.

**Durham Strop** [illegible] $1 00

### ENDERS

Enders Strop is especially adapted for stropping Enders Blades. Double Strop, one side prepared carburundum coated canvas strop for honing and one side of finest calfskin leather

| | Per Doz. |
|---|---|
| **E105 Enders Strop** [illegible] | $6 00 |

# Enders Stropping Machine

Enders Razor Stropper is especially adapted for stropping Enders Blades and [illegible] blades per set, particularly when used with the Enders Strop. It holds the blade on the strop at exactly the proper angle.

| | Each |
|---|---|
| **Enders Stropper** [illegible] | $12 00 |

# Safety Razors

## AUTO STROP

Shows Stropping Device

A Safety Razor which has a self-contained stropping arrangement which permits the user to strop and thoroughly clean razor, without removing blade from holder. The stropping renews the blade edge with utmost convenience and prevents the constant blade expense which is the just complaint against other safety razors. All cases are lined with silk plush.

**12 Blades and Auto Strop strop with each Razor.**

No. 5 and 1 5

| | Each |
|---|---|
| **No. 1 Morocco** Black Leather Case, Quadruple Silver Plated Razor | $5 00 |
| **No. 1A** Pigskin Case " " " " | 6 00 |
| **No. 50 Heavy Nickel Case** " " " " | 5.00 |
| **No. 53 Gun Metal Finish,** Polished Case, Gold " " | 5 50 |
| **No. 54 Satin Metal Finished Case** " " " | 5 50 |
| **No. 56, Satin Finish Gold Plated Case** " " " | 6 00 |

No. 15

No 25

**No. 15 Morocco** grain black leather case, silver plated razor, collapsible lather brush in silver plated tube, stick of shaving soap in silver plated push bottom tube, case 3¼x4¼ in. ..... Each $6.50

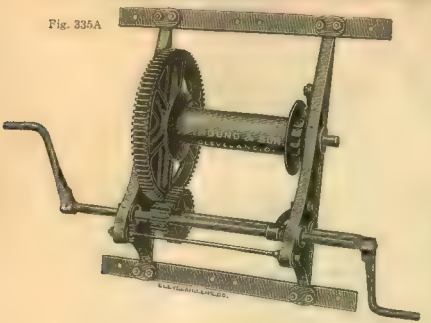
**No. 25 Morocco** case silver plated razor fine badger hair shaving brush and stick of shaving soap in silver plated push bottom tubes case 3½ x 5 inches ..... Each $7.50

### "EVER READY"

Nickel Plated Frame with Twelve Blades in Lined Leatherette Case

| | Per Doz. |
|---|---|
| Razors Complete | $12.00 |
| Blades, 10 in Set | .50 |

Fig. 335A




## WINCHES

### Derrick Pole Winch

For Single or Double Poles

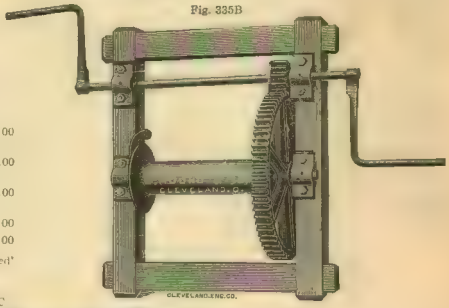
One for Double Poles always sent unless otherwise ordered. No. 20 is single geared. All others double geared as shown in illustration

Specify number and capacity in order.

| No. | Capacity with Sheaves Tons | Capacity Direct Tons | Price |
|---|---|---|---|
| 20 | 1 | ¼ | $35.00 |
| 21 | 2 | ½ | 45.00 |
| 22 | 5 | 1 | 85.00 |
| 23 | 8 | 1½ | 90.00 |
| 24 | 10 | 2 | 110.00 |
| 25 | 12 | 2½ | 120 00 |
| 26 | 15 | 3 | 140.00 |

With Pawl Stop and Strap Brake.

Fig. 335B



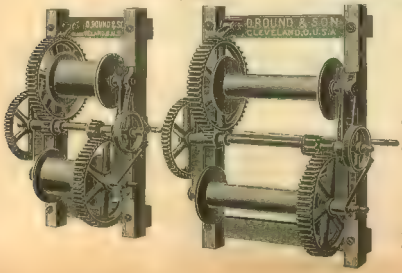

### Derrick Winches

For Stone Quarries, Loading Cars, Masonry work, Etc.

Single geared, as per cut, with pawl stop, capacity, 2½ tons $35.00
Single geared, as per cut, with pawl stop, capacity, 4 tons 45.00
Double geared, with pawl, stop capacity, 4 tons..... 50.00
Double geared, with pawl, stop capacity, 8 tons..... 70.00
Strap Hand Brake for either, ex. 6.00

Larger can be furnished if desired' write for price.

Fig. 335C




Upright Pattern

### Double Purchase, Double Drum Derrick Winches

These cuts show Double Drum, Double Purchase Derrick Winches. The double purchase winches are suitable for handling heavy loads, and are very powerful and well built machines.

| Size No. | Dimensions of Drum | Dimensions of Main Gears | Price |
|---|---|---|---|
| 50 Wire | 8 x16 in. | 20x2½ | $75.00 |
| 51 Wire | 10 x18 " | 24x2½ | 90.00 |
| 52 Manila | 8½x22 " | 20x2½ | 75.00 |
| 53 Manila | 6 x30 " | 24x2½ | 90.00 |

# Electric Fans

## DESK AND BRACKET TYPE

### Direct Current, Three Speeds

| Size | Volts | Speed | Approx. Net Weight | Each |
|---|---|---|---|---|
| 8 in. | 100 to 125 | 1000–1450–2100 | [illegible] lbs | $17 00 |
| 12 in. | 100 to 125 | 1000–1300–1650 | 2[illegible] lbs | 27 00 |
| 16 in. | 100 to 125 | 1000–1300–1600 | 2[illegible] lbs | 31 00 |

### Alternating Current, Two and Three Speeds

| Size | Volts | Speed | Cycles | Approx. Net Weight | Each |
|---|---|---|---|---|---|
| 8 in. | 100 to 125 | 1000–1400–1750 | 60 | 5[illegible] lbs | $17 00 |
| 12 in. | 100 to 125 | 1300–1500 | 60 | 22 lbs | 30 00 |
| 12 in | 200 to 230 | 1300–1500 | 60 | 22 lbs | 32 00 |
| 16 in. | 100 to 125 | 1250–1500 | 60 | 25½ lbs | 35 00 |
| 16 in. | 200 to 230 | 1250–1500 | 60 | 25½ lbs.. | 37 00 |

## CEILING FANS

### Direct Current, Three Speeds

| Blades | Volts | Speed | Finish | Approx. Net. Wt. | Each |
|---|---|---|---|---|---|
| 4–57 in. sweep | 100 to 115 | 100–150–200 | Mottled Copper | 68 lbs | $56 00 |
| 4–57 in. sweep | 100 to 115 | 100–150–200 | Black Japan | 68 lbs | 48 00 |

### Alternating Current, Two and Three Speeds

| Blades | Volts | Speed | Cycles | Finish | Approx. Net Wt. | Each |
|---|---|---|---|---|---|---|
| 4–57 in. sweep | 100 to 115 | 100–150–200 | 60 | Mottled Copper | 60 lbs.. | $65 00 |
| 4–57 in. sweep | 100 to 115 | 150–200 | 60 | Black Japan | 58 lbs | 59 00 |
| 4–57 in. sweep | 200 to 230 | 100–150–200 | 60 | Mottled Copper | 60 lbs | 67 00 |
| 4–57 in. sweep | 200 to 230 | 150–200 | 60 | Black Japan | 58 lbs. | 61 00 |

## VENTILATING FANS

### Direct Current, Three Speeds

| Size | Volts | Speed | Approx. Net. Wt. | Each |
|---|---|---|---|---|
| 12 in. | 100 to 115 | 1650 | 24 lbs | $51 00 |
| 12 in | 200 to 230 | 1650 | 24 lbs | 55 50 |
| 16 in. | 100 to 115 | 1600 | 28 lbs | 68 50 |
| 16 in. | 200 to 230 | 1600 | 28 lbs | 73 00 |

### Alternating Current

| Size | Volts | Speed | Cycles | Approx. Net Wt. | Each |
|---|---|---|---|---|---|
| 12 in | 100 to 115 | 1500 | 60 | 40 lbs. | $51 00 |
| 12 in | 200 to 230 | 1500 | 60 | 40 lbs. | 55 50 |
| 16 in | 100 to 115 | 1500 | 60 | 50 lbs. | 66 50 |
| 16 in | 200 to 230 | 1500 | 60 | 50 lbs | 71 00 |

# Sewing Machine Motors

The General Electric sewing machine motor has a frame with a clamping foot for attaching the motor to the sewing machine table. The motor is extremely simple in construction and, with the assistance of the instructions supplied with each outfit, can be attached without difficulty by any one possessing ordinary intelligence. The complete outfit consists of the motor, a rocker arm with idle pulley and brake, leather belt, clamp, hooks and treadle chain.

General Electric sewing machine motors can be attached to most of the standard sewing machines of both the drop and stationary head types. Direct current motors of 1/15 H.P. capacity and alternating current motors of 1/30 H.P. are supplied for domestic use.

## FOR STATIONARY HEAD MACHINES

Singer, Wheeler & Wilson, New Home, White, Domestic, Demorest, and Standard

### Alternating Current Single-Phase

| | Type | Pole | H.P. | Speed | Volts | Cycles | Weight in Lbs. Net | Weight in Lbs. Shipping | List Price |
|---|---|---|---|---|---|---|---|---|---|
| 23914 | UI | 8 | 1/30 | 1875 | 110 | 125 | 25 | 46 | $25 00 |
| 23915 | UI | 4 | 1/30 | 1800 | 110 | 60 | 25 | 46 | 25 00 |
| 31626 | UI | 8 | 1/30 | 1875 | 220 | 125 | 25 | 46 | 25 00 |
| 31627 | UI | 4 | 1/30 | 1800 | 220 | 60 | 25 | 46 | 25 00 |
| 31628 | IS | 8 | 1/15 | 1875 | 110 | 125 | 29 | 51 | 40 00 |
| 31629 | IS | 4 | 1/15 | 1800 | 110 | 60 | 29 | 51 | 40 00 |
| 31630 | IS | 8 | 1/15 | 1875 | 220 | 125 | 29 | 51 | 40 00 |
| 31631 | IS | 4 | 1/15 | 1800 | 220 | 60 | 29 | 51 | 40 00 |

### Direct Current

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 23916 | FD | 2 | 1/15 | 1600 | 115 | | 21 | 43 | $30 00 |
| 31632 | FD | 2 | 1/15 | 1600 | 230 | | 21 | 43 | 32 00 |

## FOR SINGER DROP HEAD MACHINES

### Alternating Current Single-Phase

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 23917 | UI | 8 | 1/30 | 1875 | 110 | 125 | 25 | 46 | $25 00 |
| 23918 | UI | 4 | 1/30 | 1800 | 110 | 60 | 25 | 46 | 25 00 |
| 31635 | UI | 8 | 1/30 | 1875 | 220 | 125 | 25 | 46 | 25 00 |
| 31636 | UI | 4 | 1/30 | 1800 | 220 | 60 | 25 | 46 | 25 00 |

### Direct Current Shunt Wound

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 23919 | FD | 2 | 1/15 | 1600 | 115 | | 21 | 43 | $30 00 |
| 31637 | FD | 2 | 1/15 | 1600 | 230 | | 21 | 43 | 32 00 |

## FOR WILCOX & GIBBS STATIONARY OR DROP HEAD

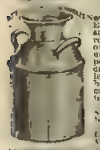
### Alternating Current Single-Phase

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 23920 | UI | 8 | 1/30 | 1875 | 110 | 125 | 25 | 46 | $25 00 |
| 23921 | UI | 4 | 1/30 | 1800 | 110 | 60 | 25 | 46 | 25 00 |
| 31638 | UI | 8 | 1/30 | 1875 | 220 | 125 | 25 | 46 | 25 00 |
| 31639 | UI | 4 | 1/30 | 1800 | 220 | 60 | 25 | 46 | 25 00 |

### Direct Current Shunt Wound

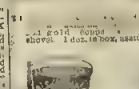
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 23922 | FD | 2 | 1/15 | 1600 | 115 | | 21 | 43 | $30 00 |
| 31640 | FD | 2 | 1/15 | 1600 | 230 | | 21 | 43 | 32 00 |

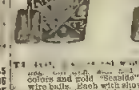
## RAILROAD MILK CANS.

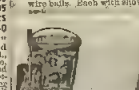


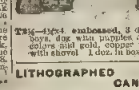
## The Market's Best CREAM SEPARATOR.

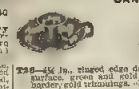
## SEASIDE OR SAND PAILS AND SHOVELS



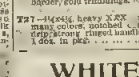




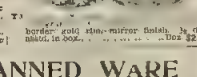




## LITHOGRAPHED CANDLESTICKS

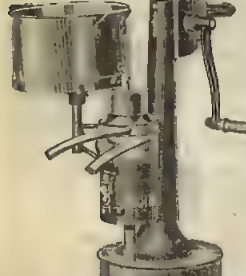


## ROYAL SAXONY TRAY OR PLATE.



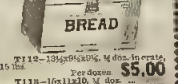
## THE "ELGIN" CREAM SEPARATOR

**The Best Disc Cream Separator Made.**



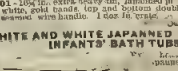
## WHITE JAPANNED WARE

### WHITE JAPANNED BREAD BOXES.



### WHITE JAPANNED FOOT TUB.

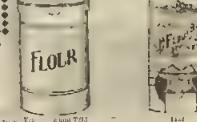
### WHITE AND WHITE JAPANNED INFANTS' BATH TUBS.



### WHITE JAPANNED CANISTERS.

### WHITE AND WHITE JAPANNED CANISTER ASSORTMENT.

### WHITE JAPANNED FLOUR BINS AND SIFTER.



# PIECED WARE

## WASH BOILERS—*Sold only by crate.*

All tested before leaving factory—no leakers.

*NOTE—If you want us to nest wash boilers and will order equal quantities we will do so without charge.*

SIZES of all our wash boilers are as follows: No. 6, 20x11, No. 9, 23x11.

T1736, IC Tin Bottom, No. 6 ... $4.95

T674-999, Galvanized Bottom, No. 6 ... $4.75

Sizes drop ¼ doz. each Nos. 8 and 9 in crate. Doz. $4.95

T999 Wash Boiler ... assortment.

High Grade Copper Bottom ... grade goods with flat copper handles.

T2178—8, IC ... $6.75
T2199—9, IC ... 7.75
... 8.75
... 9.75
... 10.75
... 11.75

High Grade Copper Bottom Tinned Copper Rim Wash Boilers

T2178—8, IX ... $7.50
T2199—9, IX ... 8.50
... 9.50
... 10.50
... 11.50

IXXXX Copper Bottom Wash Boiler

T2178—8, IXXXX ... $8.25
T2199—9, IXXXX ... 9.25
... 10.25
... 11.25

RIGHT HOME

When boiler is laid on side a perfect ... Black enamel steel wood ... weighs 4.75 lbs., can stand on it without ... flat or circular level. Note the size on these ...

T2—21 ... Wt. each 5¾ lbs. 3 in crate, 48 lbs. Each ... $1.30

... Copper Bottom Wash Boiler ... $1.45

... Copper Bottom Wash Boiler ... $1.60

... 12 qts. 3 only in crate, 30 lbs. ... $1.70

T5899—9, 12 qts. 3 only in crate. 32 lbs. Each, $1.80

T5428—8, 14 qts. 3 only in crate. 21 lbs. Each $1.85

T5390 9, 14 qts. 3 only in crate. 2 ... $2.05

## ALL COPPER WASH BOILERS.

*The best wash boiler made—for sure.*

Guaranteed full wt. copper, heaviest ... made through & through. Must not ... sheet them. Will outwear a dozen ...

| | | |
|---|---|---|
| T5678—8, 16 qts. 1 only in crate, 15 lbs. | Each | $2.20 |
| T5899—9, 16 qts. 1 only in crate, 14 lbs. | Each | $2.45 |
| T5678—8, 18 qts. 1 only in crate, 18 lbs. | Each, | $2.25 |
| T5899—9, 18 qts. 1 only in crate, 16 lbs. | Each. | $2.85 |

## THE "20TH CENTURY" WASHER AND DISPLAY STAND.

*Runs gas handled H Practical in all respects. Will do good work.*

30 lb. wood dash. This washing is by compressed air action which ...

T19—IXL polished tin, 30 in wood handle. Per dozen, **$4.25**

**92c**

Stand for 20th Century Washer ... each order for ¼ doz. of the above.

## "STARTER" ASSORTMENT OF PIECED TINWARE.

T11—Consists of the following staples:
1 only No. 8 IC galvanized bottom, wash boiler.
2 only No. 8 IC copper bottom wash boiler.
2 only No. 9 IC copper bottom wash boiler.
1 only No. 8 IX copper bottom and rim wash boiler.
2 doz T21½, 1 pt., pieced cup, 2½x3¼.
½ " T14, 4 qt. low covered bucket, 6½x8¼.
½ " T19, 8 " " " 9½x10½.
1 " T20, 1 " " " 5½x5½.
1 " T61, 1 graduated measures.
1 " T61, 1 gal. tin dipper.
1 pr. T1, flour sifter 6¾x9.

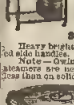
Note—This assortment can be shipped all nested tinware, wt. 90 lbs. ... **$8.00**

## BANNER BOILER DISPLAY RACK.

Just the thing to sell more boilers for you. Can be placed in any part of store.

T1—Made entirely of steel ... 25 wash boilers in the rack. ... Each boiler is provided with roller bearing casters, ... finished in dead black ... this boiler display rack you ever had in your store. Shipped K. D. Each ... $5.50

## STEAMERS.



Heavy bright tin, perforated bottom, solder ... fold side handles.

Note—Owing to the fact that assorted ... nests are nested the freight will be much ... less than on solid sizes.

Stamped Over Steamers, 1 doz. in crate, no ... nest ... T7—9x5, 16 lbs. Doz. $1.32
... ...low ... 21
... $1.40
... $1.75

Tinned Copper Steamers—½ doz. in crate.
T70—9x5, 10 lbs. Per ... $1.50
... $1.90
... $1.70
... doz. in crate, 28 lbs. ... Crate, $1.85

## TIN MOUSE TRAPS

... water, 1 doz. in box. ... Doz. 85c

## TEA AND COFFEE POTS.

Riveted spouts and handles.

Coffee Pot

Finish—Bright tin, double seamed, soldered ... mixed not to leak, hinged cover, black enameled knob. Each wrapped.

| | | | | |
|---|---|---|---|---|
| T | 1–3 pt. coffee. | 1 doz. in crate | Doz. | $0.70 |
| T | 3–8 " | 1 " | | 90 |
| T | 3 | | | 1 10 |
| T | | | | 1.25 |
| T | 1 | | | 70 |
| T | | | | 90 |
| T | | | | 1 10 |

## OIL STOVE TEA KETTLE.

T62—2 qt., 8¼ in., double seamed bottom, ... Each wrapped ... $1 20

## STAPLE LARD CANS.

... and T23

Regulation—Extra heavy tin, double seamed, stamped seamless cover fits over outside, lacquered, riveted ears.

T13—3 gal., 10x9, 25 lb. with coppered wire bail. 1 doz. in crate, 67 lbs. ... Doz. $2.25
T17—5 gal., 13x9x12¾, 50 lbs. as T13, but with side handles instead of bail. ¼ doz. in crate, 35 lbs. ... Doz. $3.10
T16-1S-20 As ... tin covers ...
... T13, 6 gal. ... 11x13¾
... T20, 10 " ... 13 x15
... T20, 10 " ... 13 x18¾
Total 1 doz. in crate, 55 lbs., no less sold. Doz. $3.75

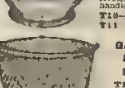
## COLANDERS.

Extra well made, double seamed throughout, big foot, riveted, side tinned handle.

T18—10 in. Doz. 84c
T11 ... 95c

## GALVANIZED WIRE BASKETS.

T1, ½ Bushel —Heavy galvanized wire, beaded top, bottom and sides with wire ...



... $3.00
Doz. $9.00

## THE "OUT OF SIGHT" CUSPIDOR.

Antique Bronze Finish.

T100 ... All metal ... brushing ...

... head base opens, and is ready for use, to clean again place foot cuddler turtle's head. 1 in carton ... $1.90

## FLOUR SIFTERS.

T44, "Pantry"—3¼x3¾, extra heavy tinned ... wired wire bottom, and agitator, metal ... knob, double riveted. 1 doz. in box. Doz. 48c

T10 ... Wire ...

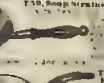
... 72c

T15 ... Steamer ... all heavy extra extra ... well made, wood "Steamer" on each ... tinned wire ... 1 doz. in box. Doz. 89c

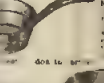
T15, "New Standard" ... Sifter ... ¼ doz. in box. ... $1.45

## PIECED STRAINERS.

T19, Soup Strainer ... 45c

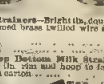


... 60c

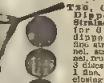


... doz. in ... 75c

Milk Strainers—Bright tin, double seamed, double seamed brass twilled wire strainer ... doz. in pkg. T 8 ... Doz. 72c
T10, 10 " ... 96c
T20, Soup Bottom Milk Strainer—8 in. ... bent to fit tin pail and hook to fasten ... 1 doz. in carton ... Doz. 78c



T26, Graduated Dipper and Strainer. Used for 6 purposes ... dipper, strainer ... flop strainer, fine ... meal sifter, ... meal, fruit, fine sifter, ... 2 discs, 1 coarse, 1 fine. 1 solid for ... cloister bottom ...

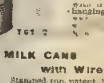


... 72c

## COVERED PIECED SAUCE PANS.

Heavy IC tin, double seamed bottom, ... tinned handles ... cover for hanging ... cover ...

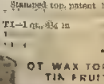
T61 2 ... 80c



## MILK CANS with Wire Bails.

Stamped top, patent bottom, ...

T1—1 qt., 8¼ in. ... 70c
... 85c
... 90c

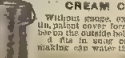


## QT WAX TOP TIN FRUIT CAN.

... soldered, guaranteed not to leak. Names of the different fruit stamped on ...

... $3.50

## CREAM CANS.



Without spout, extra heavy IX tin, patent cover forms air chamber on the outside below wire rims ... fits in same on the ... making can water tight, no ...

T14—14 qt., 8¾x13¾ ... 1½ doz. in crate, 52 lbs. ... Doz. $2.40
T20 20 qt., 8¾x18¾ ... crate, 87 lbs. ... $1 0

## The Above Illustration is of the Home of the

# "EMANCIPATOR"

## The "Free from Trouble" Car

### Price, $1100, Fully Equipped

**Good dates of delivery for good agents. We are busy making cars, not promises**

### SPECIFICATIONS

Body—Wood
Body Design—Toy Tonneau
Color Dark Green, Red Gear
Seating Capacity 4 Passengers
Total Weight—1,600 Pounds
Wheel Base—100 Inches
Tire Dimensions—32x3½
Steering—Locking Irreversible
Brakes Double, Internal and External
Motor—4-Cyl., 20 H. P. Multi-Unit
Bore—4 Inches, Stroke 3½ Inches
Cooling—Thermo Syphon-Water
Ignition Jump Spark
Electric Source—Storage Battery
Drive—Shaft
Transmission—Noiseless Planetary
Speeds—Two and Reverse

### EQUIPMENT

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We are also makers of the AURORA RUNABOUT $800 and AURORA LIGHT DELIVERY WAGON—$1000

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**SAVES AS MUCH AS A THOUSAND DOLLARS**

## More Victories in California

Once again the Kissel Kar accomplishes remarkable performances in the Pasadena-Altadena hill climb. This is the Kissel Kar score in 1909 climb

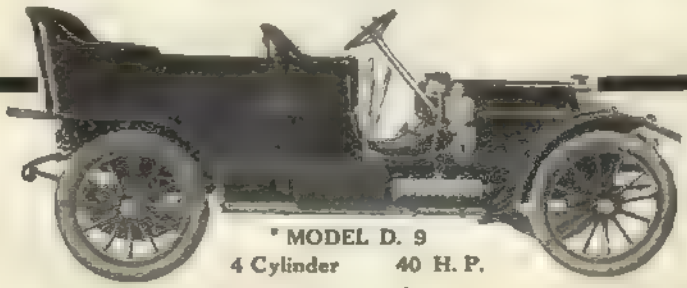
"Kissel Thirty won $1001 to $1500 in touring car class. Kissel Forty second in $1501 to $2000 touring car class. Kissel Forty first in $1501 to $2000 roadster class. Kissel Sixty second in $2500 to $3000 roadster class. Kissel Sixty second in free-for-all roadster stock car class." And the Kissel Kar still holds the fastest road record in California.

Every model of the Kissel Kar has the same construction—only the difference in size makes the price differences. The construction is standard like best American and foreign cars. Timken roller bearings throughout, 4 elliptic springs, double ignition, floating type rear axle, I beam front axle—every standard approved feature.

Model L D 9, 4 cylinder, 30 H P, four and five passenger, Remy magneto and dry cells. Roadster, $1350; Touring Car, $1500.
Model D 9, 4 cylinder 40 H P, five and seven passenger. Remy magneto, or Atwater-Kent generator and dry cells. Roadster and Touring Car $2000
Model G. 9 6 cylinder, 60 H P, Remy magneto or Atwater-Kent generator and dry cells, $3000

*WRITE FOR CATALOG*

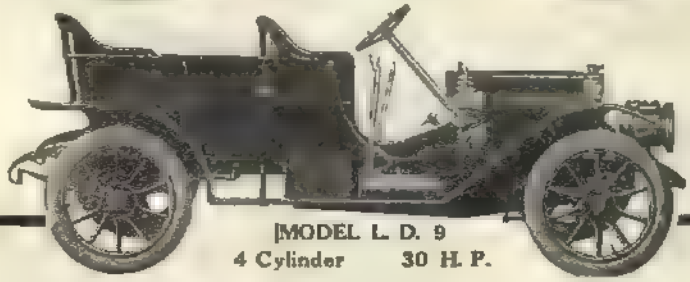
**Roadster $2000**



**Touring Car $2000**

MODEL D. 9
4 Cylinder 40 H. P.

**Roadster $1350**



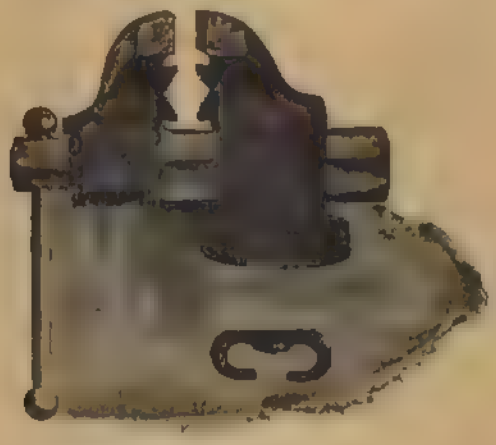
**Touring Car $1500**

MODEL L. D. 9
4 Cylinder 30 H. P.

## KISSEL MOTOR CAR CO.

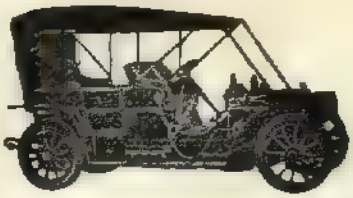
120 Kissel Ave. - HARTFORD, WIS.

# Erie Combination Pipe Vises



These Vises are of good design, strong, compact and well finished The Pipe Jaws are of Tool Steel carefully hardened and tempered. All parts are guaranteed.

| No. | Width Jaws | Capacity | Weight Pounds | Each |
|---|---|---|---|---|
| 0C | 3 in. | ⅛ to 1½ in. pipe | 24 | $12 00 |
| 1C | 3½ in. | ⅛ to 2 in. pipe | 29 | 16.00 |
| 2C | 4 in. | ⅛ to 3 in. pipe | 40 | 20.00 |
| 3C | 5 in. | ⅛ to 4 in. pipe | 70 | 28 00 |



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Ill-fitting tops make even the finest cars look cheap We will give you style and quality

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You can buy this outfit from your jobber. If he will not supply you, write us. Send for catalog.

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**CEDAR RAPIDS - - - IOWA**

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**STEAM GENERATING OUTFITS**

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We also manufacture DOUBLE ACTING COMPOUND STEAM ENGINES, of from 15 to 30 Horse Power. FEED WATER HEATERS. AUTOMATIC AIR PUMPS.

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absolutely does away with all air pressure on the fuel. In less than a minute, when starting, 50 or 150 pounds pressure can be secured. Price for size 18 x 4 in., $30 00.

All our Specialties are adapted to Whites, Stanleys, Lanes and other makes of steam cars

| Size O. D. | Height | H. P. | Price |
|---|---|---|---|
| 15½ or 16 ins | 22 in | 4-6 | $112 50 |
| 17½ or 18 " | 23 " | 6-8 | 135 00 |
| 20 " | 25 " | 8-10 | 180 00 |
| 22 " | 26 " | 10-12 | 225 00 |
| 24 " | 26 " | 12-15 | 270 00 |
| 26 " | 30 " | 20 | 385 00 |
| 32 " | 36 " | 30 | 480 00 |
| 36 " | 48 " | 40 | 560 00 |

THE BOILER

THE BURNER

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European Agents CHARLES CHURCHILL & CO., LONDON, ENG. *SEND FOR SAMPLES*

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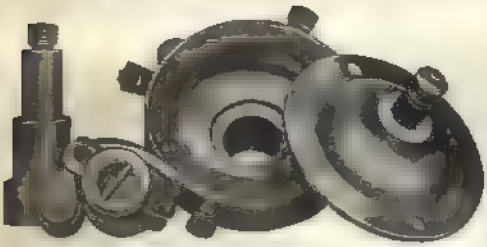

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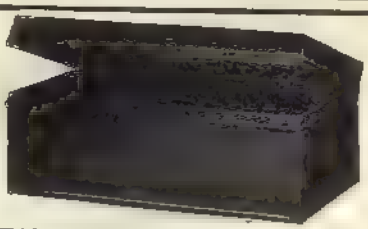
Contractors for SPECIAL AUTO PARTS



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FENDERS, FORGED IRONS, HOODS
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Maybury and Grand Trunk Railway DETROIT

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Foot Lathes
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Built on common sense lines for hard every-day service—profitable service—and to meet most severe exactions.

*Accurate—Convenient Durable*

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The Seneca Falls Mfg. Co.

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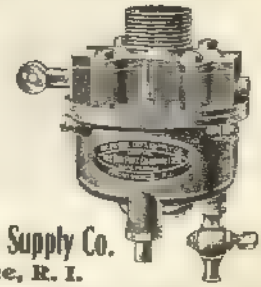
## Two Port Carbureter

No Springs

No Valves



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Providence, R. I.

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MODEL R STEERING GEAR

FOR RUNABOUTS AND AUTO-BUGGIES

THE F. H. BULTMAN CO., CLEVELAND, O.

# MONARCH

A NEW SPRING PROTECTOR AND SHOCK ABSORBER

WORTH INVESTIGATING

ILLUSTRATED DESCRIPTION ON REQUEST

W. P. KIDDER, JAMAICA PLAIN, BOSTON, MASS.

# Fishing Reels

**Expert**

Brass, Nickel Plated

| No. | Yards | Width | Diam. | Per Doz. |
|---|---|---|---|---|
| 19 | 40 | ¾ in | 2¼ in. | $24.00 |
| 17 | 100 | 1 in | ⅞ in | 30 00 |
| 22 | 200 | 1¼ in | 1 in | 39 00 |

**Allright**

Brass, Nickel Plated
Removable Spool, Back Sliding Click

| No. | Yards | Width | Diam. | Per Doz. |
|---|---|---|---|---|
| 120- | 150 | 1¼ in | 2 in | $24 00 |
| 130- | 250 | 1⅝ in | 3⅛ in | 27 00 |

**Featherlight**

Revolving Disk, Removable Spool
Back Sliding Click

| No. | | Cap. Yds | Per Doz. |
|---|---|---|---|
| 270 N- | Nickel Finish | 70 | $24.00 |
| 270 B | Gun Metal Finish | 70 | 24 00 |

**Featherlight**

Frame and Reel Seat of one piece no screws to become loose, Removable Spool, Back Sliding Click, Steel Spindle

| No. | Cap. Yds. | Width | Diam. | Per Doz. |
|---|---|---|---|---|
| 250N-Nickel Finish | 40 | ¾ in | 1¾ in. | $12 00 |
| 250B-Gun Metal Finish | 40 | ¾ in | 1¾ in. | 15 00 |
| 260B-Gun Metal Finish | 60 | 1 in | 2¼ in | 15 00 |
| 260N-Nickel Finish | 60 | 1 in | 2¼ in | 15 00 |
| 290N Nickel Finish | 100 | 1 in | 3 in | 18 00 |
| 290B Gun Metal Finish | 100 | 1 in | 3 in | 18 00 |

**Amateur**

Full Nickel-Plated
For Sea Fishing, Lies Flat on Rod, Free Running, 4½ in. in Diameter, Width 1 in.

| No. | Yds. Cap. | Per Doz |
|---|---|---|
| 1-With Drag | 150 | $12 |

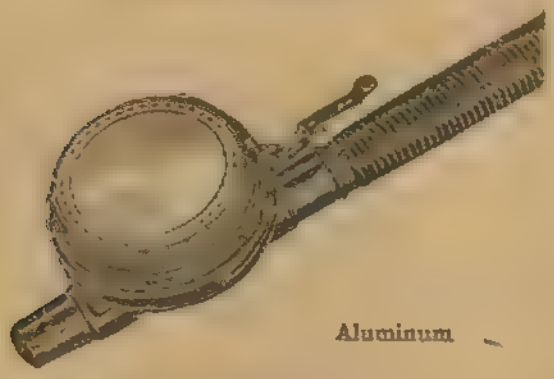
# Fishing Reels

## QUICK-A-PART
### Quadruple

Made of best German Silver throughout, Hard Brass Spools, Steel Pivots and Pinions, Phosphor Bronze Bearings. **Large Agate Jewels** on screw-out Cell Caps. Click is stopped by turning knurled nut on back. Handle Stem Click which can be brought in to act on or disengage from a slot in the rear head plate. It is easily taken apart without tools by unscrewing disc.

| No. | Cap. Yds. | Each |
|---|---|---|
| 60– | 60 | $ 4 50 |
| 80– | 80 | 5 00 |

## MARTIN'S AUTOMATIC

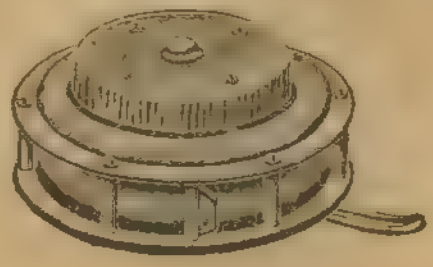


**Aluminum**

Automatic Adjustable Tension

| No. | Each |
|---|---|
| 1 Martin [illegible] | $ [illegible] |
| 2 Martin-[illegible] | $ 3 00 |
| 3 Martin [illegible] | $ [illegible] |

## ROCHESTER AUTOMATIC



**Aluminum**

Has Automatic Slip which allows line to run out after reel is fully wound. Capacity, 100 yds. G Silk.

| | Each |
|---|---|
| Rochester– | $ 5 00 |

Packed One Reel in a Box

## WOOD REELS

No. 1

Plain

| No. | Per Doz. |
|---|---|
| 10 5½ in. Dia., Natural Maple Knob Handles | $ 5 00 |
| 20–6 in. Dia., Red Varnished Maple, Knob Handles | 6.00 |
| 30–6 in. Dia., Red Varnished Maple, "S" Handle of Cast Brass | 8.00 |

Angler

Maple, Varnished Red, Heavy Cast Brass Handles, Pivoted Steel Bearings

| Size | Each |
|---|---|
| 6 in. | $ 3 00 |
| 7 in. | 3 50 |

## PICKS

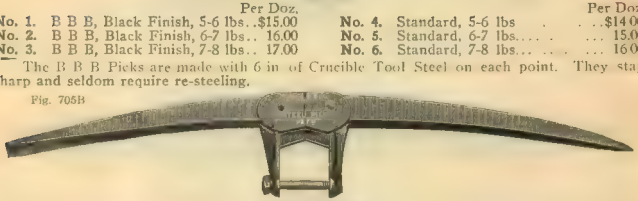
Fig. 705A

### Railroad

| | | Per Doz. | | | Per Doz. |
|---|---|---|---|---|---|
| **No. 1.** | B B B, Black Finish, 5-6 lbs. | $15.00 | **No. 4.** | Standard, 5-6 lbs | $14.00 |
| **No. 2.** | B B B, Black Finish, 6-7 lbs. | 16.00 | **No. 5.** | Standard, 6-7 lbs. | 15.00 |
| **No. 3.** | B B B, Black Finish, 7-8 lbs. | 17.00 | **No. 6.** | Standard, 7-8 lbs. | 16.00 |

The B B B Picks are made with 6 in. of Crucible Tool Steel on each point. They stay sharp and seldom require re-steeling.

Fig. 705B



### Eyeless Railroad

Weight 7 lbs ..... $20.00

Fig. 705C

### Tamping

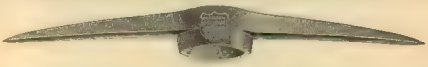
**No. 15.** Standard Pattern, 7-8 lbs. ..... Per Doz. $19.00

Fig. 705D

### Eyeless Tamping

Weight 7 lbs. ..... $24.00

Fig. 705E



### Drifting

| | | | |
|---|---|---|---|
| **No. 3.** | Standard Pattern, 4½ lbs. ..... | Per Doz. | $15.00 |
| **No. 4.** | Standard Pattern, 5 lbs. ..... | " | 16.00 |
| **No. 5.** | Standard Pattern, 6 lbs. ..... | " | 17.00 |

### Pick Eye Blanks

Fig. 705F

| Railroad | | | Drifting | | | |
|---|---|---|---|---|---|---|
| 5 lb. ..... | Per Doz. | $9.50 | **No. 3.** 4½ lbs. ..... | Per Doz. | $9.00 |
| 6 lb. ..... | " | 10.50 | **No. 4.** 5 lbs. ..... | " | 9.50 |
| 7 lb. ..... | " | 11.50 | **No. 5.** 6 lbs. ..... | " | 10.50 |

## PICKS

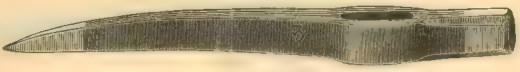
### Ore Pick

Fig. 706A

**No. 3.** Standard Pattern, 6-7 lbs. ..... Per Doz. $15.00
Standard Pattern, 7-8 lbs. ..... " 16.00

### Common Eye Ore Pick

Fig. 706B



Per Lb
**No. 12.** Lake Superior Pattern, Solid Crucible Steel, weight, each 5 to 6½ lbs.. ..... $0.20

### Adze Eye Poll Ore Pick

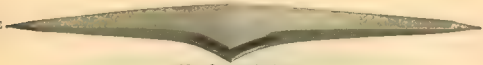
Fig. 706C

Per Lb
**No. 13.** Iron Cliff Pattern, Solid Crucible Steel, weight, each, 7 to 8 lbs ... $0.20

Fig. 706D

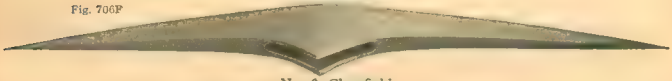
No. 1, B Flat

Fig. 706E



No. 2, Lewis Long

Fig. 706F



No. 3, Clearfield

### Coal Picks

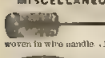
| | | | |
|---|---|---|---|
| Nos. 1, 2, 3.... | Weight, each, 2 lbs. ..... | Per Doz. | $8.50 |
| | Weight, each, 2¼ lbs. ..... | " | 9.00 |
| | Weight, each, 2½ lbs. ..... | " | 9.00 |
| | Weight, each, 3 lbs. ..... | " | 9.50 |

## STOVE BRUSHES

W551 — 11 in. ... block, red top finish, 3 rows black fib. stock, with dauber. ... Doz. $...

W556 — 12 in. ... brush ... dauber. ... Doz. $1.80

## MISCELLANEOUS BRUSHES

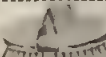


... Metal ... lacq., bleached white bristles, ... woven in wire handle ... 1 doz. in box. ... $2...

W580, Glass ... cleaning tool ... bristles fastened on wood handle, top pointed, every crevice ... 1 doz. in box. ... Doz. 85c

W19, Kabo — 8½ in., solid wood back, handle filled with kabo fiber, rounded surface ... $1...

W KABO FIBER HORSE BRUSH. *Long stiff neck, polished block.* W39—8½ ... y solid hard wood block ... natural pol ... ish. Full ... length handle. 1 doz. in box. Per dozen, **86c**



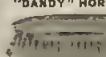
W11 — Full size, stiff ... clear white fiber, solid ... wood back, ... hand strap ... doz. in box ... Doz. 87c

W13—Large size, ... in. black tuft ... or ... tender white or ...

... imitation leather back, 4 evenly ... pitched, 3 solid ... section handle, ... in gray sound ... mixed stock ... doz. $2.10

W40 — 9 in. oval ... thickly ... with ... gray mixed ... 1 in. long ... in box.... Doz $5.25

## "DANDY" HORSE BRUSHES.



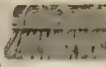
... block, wax finish friction polish, creased ... sides. ¼ doz. in box. ... Doz. 87c

... 10½ ... in solid hardwood block ... brushes ... in pantasote. ¼ doz. in box .... Doz. $1.25

... filled all palmetto and mixed gray fiber ... stock, grip sides. ¼ doz. mixed in box ... Doz. $2.00

W50—10½ in., solid hardwood, natural finish ... block 2 in. ... tic rope stock ... ¼ doz. in box ... Doz. $...

## WINDOW BRUSH.



... $3 75

## FLOOR BRUSHES—with Handles.

... Hard wood ... back panel white tampico, 7 rows wide, screw handle. ¼ doz. in box. 12 in. ... Doz. $4.60 16 in. ... Doz. $5 75

W81—A bristle, 7 rows wide, 8½ ... black oak oval hardwood block, ... gray polish finish, screw handle. ... box. ... $8 75

See Our New Lines of
BADGER
REFRIGERATORS
SCREEN GOODS LAWN FURNITURE

# FAIRVIEW MISSION SHOW CASES

**Our own special line.** Mission style molding, similar to that used on high priced made to order show cases. Cannot be purchased from anyone else as we take the entire factory output.

**QUALITY.** This brand means ... show cases made than "Fairview." Highest ... Southern or red oak wood. Fitted with "A" grade double strength glass and No. ... quality glass, all cases finished in medium shade of golden oak, ... rubbed and polished, shelves and bottom ...

**PROMPT SHIPMENT.** We now carry all goods in our own house, so goods can be forwarded same day order reaches us. **IMPORTANT.** Receipt of ... days after receipt of goods on condition ... on all export shipments. Weights may vary a little on ... of different grades and boxing.

... Base ... Base ... Base 

# BATHING SUITS, Etc.

**A splendid line.** New and exclusive designs that are made for us by one of the largest manufacturers in the country. Style, fit and workmanship guaranteed. Prices to suit every purse. *Orders samples, and compare*

## BATHING TRUNKS.

Knit cotton, good long wearing, never rots, fast size. 1 doz. in bell, solid sizes

K1258—24 in. waist...$0.75
K1259—26 " ...
K1260—28 " ...
Fast color quill navy blue, extra heavy jersey ribbed knit. 1 doz. in bell

K1261—24 in. waist...$0.87
K1262—26 " ...
K1263—28 " ...
K1264—30 " ...
K1265—32 " ...

## BOYS' & MEN'S 2 PC. BATHING SUITS.

All numbers fast Government dyes. Attractive stripings, short sleeve shirts, will retain their shape. All reinforced seamed edges

Sizes—2to14 sizes, Boys' sizes—20 to Sold o your own best of sizes. a box. BE SURE TO STATE SIZES IN ORDERING

K1267 ...

and sleeves with wristband trimmed bands. doz. in box assid.

K1229—Men's. Otherwise as K1241 ...Doz. $4.38

K1230—Men's. Dark navy blue cotton worsted, extra heavy, medium gauge in

white band. Very attractive. Assid. sizes. doz. in box

Doz. $8.75

## A GOOD DOLLAR LEADER.

*Extra well made, will give good service and will please your trade.*

K1231—Men's. Dark navy blue ...

striping or color ...

fashion ...

Per dozen. **$8.75**

K1232—Men's. Heavy Jersey knit cotton worsted, dark navy blue quarter sleeves, sleeve cuffs on arms, bottom of shirt and trunks well shaped, superior workmanship, to dye, all wool, 3 white trimmed, 1 nippon trimmed ...Doz. $10.50

K1233—Men's. Dark navy blue cotton worsted extra heavy gauge and wt., cluster striped quarter

trunks ... wool ...

trimmed, ...

rimmed ...Doz. $12.00

K1234—New Style Bathing or dy n Suit ...Leader. Heavy jersey knit, oxford gray in all wool white trimming around V neck, armholes, bottom of shirt and trunks,

*1.30

K1235 Men's. Our low priced pure worsted ... wool, medium wt., medium gauge jersey knit, quarter sleeves, sterling trimmings of broad white bands around sleeves bottom ... $1.75

K1236—Sleeveless, otherwise as K1235. Each, $.175

K1237 Men's. Heaviest, wt and every pursuit wool ed, absolutely finest ...

arms, bottom of shirt and ...

rimmed, 3 in box, 6 ... trimmed, 1 nippon trimmed ... Doz. $1.85

K1238 - Men's ...

... white ... striped ...

... ... Each $2.60

K1239—Maroon silk trimmed, otherwise as K1236. Each $2.60

## LADIES' AND MISSES' BATHING SUITS.

Up-to-date stylish models. All full and extra wide skirts, trimmed with braid and pearl buttons. Waist is blouse full, one piece skirt. Knee sizes. Send for cloth. Be sure to state size wanted when ordering.

K1931—Bright navy blue ...

... trimmed with double row ... braid. Each $1.50

K1932—Black, otherwise as K1931 Each $1.50

K1933, Latest. Fine all wool mohair, dark navy blue, full flounce with pointed ... low cut neck, short sleeves with ... full ... plaited skirt, neck ... ornamented with ... white braid trimmed ... rows narrow black ... braid ...

Each, $2.00

K1224 Black, otherwise as K1933 ... Each $2.00

K1227, Navy blue ... Dark navy blue, best all ...

... ... ... 

# Farriers Hammers

## RIVERSIDE

No. 649

No. 651

No. 652

| No. | | Per Doz. |
|---|---|---|
| 649–Boston Pattern, Polished, | Weight 12 oz | $ 9.00 |
| 651–Cincinnati Pattern, Polished, | Weight 10 oz | 7.75 |
| 652–Round Poll, Polished, | Weight 7 oz | 7.50 |

One half Doz. in a Box. Weights do not include Handles

## MAYDOLES

Whaleback, Octagon, Oil Finish

| No. | | Per Doz |
|---|---|---|
| 852–Weight 10 oz | | $ 8.00 |

One half Doz. in a Box. Weights do not include Handles

## HELLER BROTHERS

**Driving, Regular Pattern**

| No. | | Per Doz. |
|---|---|---|
| 64–Wts., 12, 13, 14, 15, 16, 17 oz | | $12.00 |

One half Doz. in a Box.

**Driving, Hellers Pattern**

| No. | | Per Doz. |
|---|---|---|
| 65–Wts., 12, 13, 14, 15, 16, 17oz | | $15.00 |

Weights include Handles

**Rounding**

| No | | Per Doz. |
|---|---|---|
| 61–Weights, 2 to 3 lbs | | $28.80 |

One quarter Doz. in a Box.

**Turning, or Cats Head**

| No. | | Per Doz. |
|---|---|---|
| 60–Weights, 2 to 3 lbs | | $28.80 |

Weights include Handles

# Hammers

## COPPER

Solid Cast Copper, for Machinists, etc—Unhandled

| Weight | Each | Weight | Each |
|---|---|---|---|
| 1 lb | $ 1.00 | 4 lbs | $ 4.00 |
| 1½ lbs | 1.50 | 5 lbs | 5.00 |
| 2 lbs | 2.00 | 6 lbs | 6.00 |
| 2½ lbs | 2.50 | 8 lbs | 8.00 |
| 3 lbs | 3.00 | 10 lbs | 10.00 |

## SHOEMAKERS

Cast Iron Japanned, Polished Face

| No. | Weight | Per Doz. |
|---|---|---|
| 035 | 10 ounces | $ 3.00 |

Cast Steel, Polished

| No. | Weight | Per Doz |
|---|---|---|
| 1 | 13 ounces | $ 8.50 |

One half Doz. in a Box

## LADIES

Cast Iron, Full Polished, Varnished Handle

| No. | Weight | Per Doz. |
|---|---|---|
| 260 | 6 ounces | $ 1.50 |

One-half Doz. in a Box

# FEDDERS RADIATORS

The real square tube radiator—
The New York to Paris Radiator

Will be very much in evidence on the LEADERS.
Look for them. Cut shows one.
You know the make.

FEDDERS MFG. WORKS
BUFFALO, N. Y.

WEAR LONGEST

# EMPIRE TIRES

## EMPIRE AUTOMOBILE TIRE COMPANY

Factory—TRENTON, N. J. U. S. A.

BRANCHES.

NEWARK—364 Halsey St. DETROIT—342 Woodward Ave. BOSTON—282 Devonshire St. CHICAGO—20 La Salle St. CHICAGO—1361 Michigan Ave. NEW YORK—15d and Broadway. NEW YORK—144 Chambers St.

AGENCIES.

PITTSBURG—Consumers' Auto Supply Co. KANSAS CITY, MO.—Empire Tire & Rubber Co. ATLANTA GA.—Dunham Rubber Co. CLEVELAND, O Motor Supply Agency Co. NORFOLK, VA.—Wm H Grover DENVER, COL.—Denver Auto Goods Co. JACKSONVILLE, FLA.—Savell Rubber Co. PHILADELPHIA, PA.—Penn Auto Supply Co. LOS ANGELES, CAL.—Pacific Electrical Wks. BUFFALO, N Y Empire Sales Co MINNEAPOLIS, MINN Empire Tire & Rubber Co. SAVANNAH, GA.—Harris Tire Co. NEW ORLEANS LA.—E. A. Tetard.

# The Four-Cylinder Reo

**A high-powered car rich and handsome for $1250**

You Can do it with a REO

This car, at this price, is so remarkable an achievement that the thinking man will want it explained. The 1910 Reo catalogue (now ready) tells bottom facts and reasons why. Here are only a few:

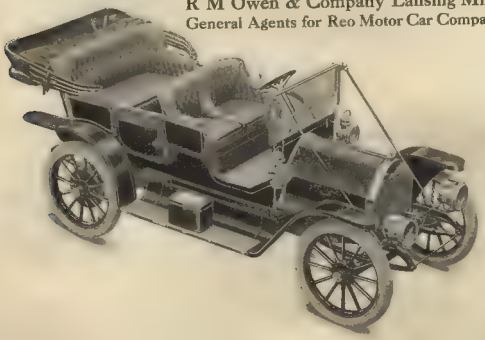
A vast amount of power developed in a long stroke motor (4x4½) with big intake and exhaust valves (one at the top, and one on the side of the cylinder) letting in and discharging a great amount of gas. Every working part of the car is thought out and developed to the last degree of perfection, and is machined down to the ultimate possible refinement. We put the costs where they count for power and effectiveness. A strong, effective pump that rapidly sends a great amount of water straight to the point where it is most needed (the exhaust valve) before cooling the rest of the motor. The cam gears are designed to open the valves more quickly than they have ever been opened before in any car. Lubrication system, without waste or contamination of oil, puts it where it does the most good (the main bearings of the motor and the face of the cam gears) and afterwards sends a proper amount of oil spray to the working side of the cylinders and pistons. The clutch positively engages and releases at the will of the operator. The whole working mechanism of the car from stem to stem is protected from dust, with the leakage of oil made almost impossible. The saving of friction has been worked out and is exemplified in this car on an extraordinary degree. Another great power-waster—lost motion—is avoided, first, by great refinement in manufacture, and second, by making possible quick adjustments of all parts likely to become loose—the connecting rods and main bearings, for example (easily reached through a hand hold in the crank case, the bevel gear (easily reached through the rear axle housing), and so on throughout the entire mechanism.

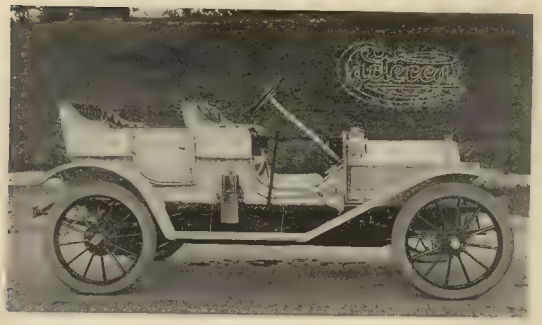
30 horse-power, 50 miles an hour if you want it, perfect action on the hills—everything you want in a car, including economical up-keep. The driver's seat and control are on the left—which is the right place for them.

*Send for the Catalogue*

**R M Owen & Company Lansing Mich**

**General Agents for Reo Motor Car Company**






# A Splendid Hill Climber, a Quiet, Smooth-Running, Powerful, Little Four Cylinder Model "H" (with Miniature Tonneau), $1,150

¶ This little car is the surprise and the delight of all who ride in it. It is a high-grade automobile in every particular.

¶ It will climb a fifty per cent hill with a load.

¶ It runs as quiet as can be. It runs so smoothly that you would hardly know it was passing on the street.

¶ The motor has four cylinders, 4-inch bore and 4-inch stroke. We claim for it 22 horse power.

¶ This car will climb, runs quietly, is easy to handle, costs little to maintain, will travel farthest on a gallon of gasoline, requires little oil, and is the best to buy for these reasons:—

¶ All CARTERCARS are equipped with our Friction Transmission and Chain-in-Oil Drive.

¶ This transmission and drive delivers a large percentage of the motor power to the rear wheels.

¶ It makes the car easy to care for and maintain, because there is no clutch to slip, no gears to strip, no grease packing to renew, no universal joints, no bevel gears, no noise, and it has only one operating lever.

¶ It is equipped with magneto, gas lamps, generator, oil lamps, horn, tools, jack, and tire kit.

¶ With single rumble seat the price is $1,100. With double rumble seat, $1,125. With miniature tonneau, $1,150. All are interchangeable. Write

## Cartercar Company

**Pontiac, Michigan** **Member A. M. C. M. A.**

# BUCKEYE JACKS
## IN ALL SIZES

**Suitable for any size and style Automobile made.**
**For cars weighing from 500 to 8000 pounds.**
**The largest variety of sizes made by any jack manufacturing company in America.**

| Style | Capacity | Height Bar Down | Rise of Bar | Height Bar Raised | Weight Pounds | Size of Base |
|---|---|---|---|---|---|---|
| No 0 | 1 Ton | 12″ | 6″ | 18″ | 9 | 3¾x5½″ |
| 05 | 1 Ton | 12″ | 6″ | 18″ | 9 | 3¾x5½″ |
| 02 | 1 Ton | 12 | 6″ | 18″ | 8¼ | 3 x5⅛″ |
| 01 | 1 Ton | 8¼″ | 5″ | 13¼″ | 8¼ | 3 x5⅛″ |
| 01 | 1 Ton | 9½″ | 5″ | 14½″ | 8¼ | 3¾x5½″ |
| 03 | 1 Ton | 10″ | 5¼″ | 15¼″ | 5¼ | 2¾x4¼″ |

NOTE No 0 Jack Double Acting. All Others Single Acting. All Buckeye Jacks Equipped with New Reversing Lever. Only manufacturers of Jacks using Steel Drop Forgings, Heat Treated. Get our prices. We will save you money.

Nos 0 and 05 intended for heaviest touring cars with 32 to 36 in wheels No 02 for heavy touring cars with steel wood wheels No 01 for heavy runabouts and touring cars with 30 in wheels clearance No 03 for light runabouts and light touring cars up to 3000 pounds Designed superior to any for the many light touring cars now running out Guaranteed best workmanship, material and finish in the world

**THE BUCKEYE JACK MFG. CO.**
LOUISVILLE, OHIO



## Mr. Manufacturer:

If you want to make your customers happy include in the tool-kit which you furnish them

# THE FRANK MOSSBERG CO.'S WRENCH

**THE FRANK MOSSBERG CO.'S WRENCHES** have a reputation for good, hard service. Our Series "A" are especially adapted for automobile use. They are thoroughly case-hardened; neat, strong, and best of all—inexpensive.

**Each Wrench is Guaranteed** and bears this trade mark.

Write for prices in quantities.

**FRANK MOSSBERG CO., Attleboro, Mass.**

116 LAKE ST., CHICAGO, ILL. 132 VALENCIA ST., SAN FRANCISCO

# RAYBESTOS

*Raybestos as a brake facing*

## Mr. Manufacturer!

## This interests you

Raybestos Friction Facing for brakes and clutches can be worked with the same tools in machining that are used for **cutting metal.** Rivet holes may be either punched or drilled and may be counter-sunk or counter-bored so as to allow the rivet head to stand for some distance entirely below the surface of the surrounding material. No other brake lining, or facing for clutches possesses this exceptional feature.

Raybestos does not become hard or soft.

It works **absolutely uniform,** therefore its effectiveness is not impaired as long as there is a particle of material left.

Write us for particulars.

## ROYAL EQUIPMENT CO.

**151 Housatonic Ave.**

**BRIDGEPORT, - CONN.**

# ANY OLD PLUG

is good enough for any OLD PLUG OF A CAR BUT MILEAGE INTERESTS the owners of high class Motors

**Flash Light Plugs**

have given 15,000 miles without removing from the cylinders and were then ready for a trip around the world

**Our Platinum Iridium Points**

cost us more than PURE GOLD, BUT the POINT is the

F L A S H

L I G H T

LIFE OF IT, and OURS LIVE LONGER than any other PLUG IN THE WORLD

**NEW**

**1909**

**MODELS**

½ in. STANDARD METRIC
A. L. A. M
½ x 18 in. THREAD
AND SPECIALS

**Get the Best in the World**

**Price, $1.50 Each**

## Janney, Steinmetz & Co.

**403 Market St., Philadelphia**

# Model "G" Special The Glide Automobile $2500

## You Know Automobiles--Read These Glide Specifications

THE Glide is the first car perfect in size, in mechanism and in action that has ever been offered to the public at a correct price.

Many years of automobile building are back of every Glide. Years of fruitful experience that have added to the merits and popularity of GLIDE cars.

The power plant is a 4-cylinder (cast separately) 45 actual H.-P. motor. The crank shaft has 5 bearings,—as it should have.

A constant level oiling system, eliminating piping and automatically maintaining the proper level of oil in the crank case at all times.

An improved form of selective type of transmission located just forward of the rear axle, reducing the angularity of the propeller shaft.

A rear axle with liberally proportioned parts, and of a construction that gives an absolute assurance of perfect work.

A multiple disc clutch with discs of large diameter.

Double set of brakes—internal expanding and external contracting. Brake drums are 16 in. in diameter, 3-in face—will hold the car on a mountain grade. Absolute confidence in ability to slow down or halt at will is established when Glide brake equipment is examined. No brake system on any American or Foreign car has ever before been so comprehensively treated.

One Universal Joint only in GLIDE cars, located between the motor and the transmission. Remember, there are not two joints or three joints, or even four, as in other constructions. Timken Roller Bearing throughout—all gears of the best Alloy steel.

34 x 4½-in. tires all around—Wheel base 120 in. Remember tires are all alike, not 3½ x 4-in. in front and 34 x 4½ in the rear, thus obviating the ridiculous necessity of carrying two sizes of spare castings and tubes.

The GLIDE is not an assembled car. It is built in our own shops, the motor excepted.

The GLIDE cars are sold before dealers buy them.

Buyers know that Glide cars at $2 500 are better cars than they can get for the same money anywhere else.

They know not only because of our extensive Glide advertising, but also because of Glide demonstrations and widely increasing sales.

Our advertising helps you sell Glide cars—and every sale brings another sale to you.

Our position is the one all manufacturers must take sooner or later—giving full value for the price.

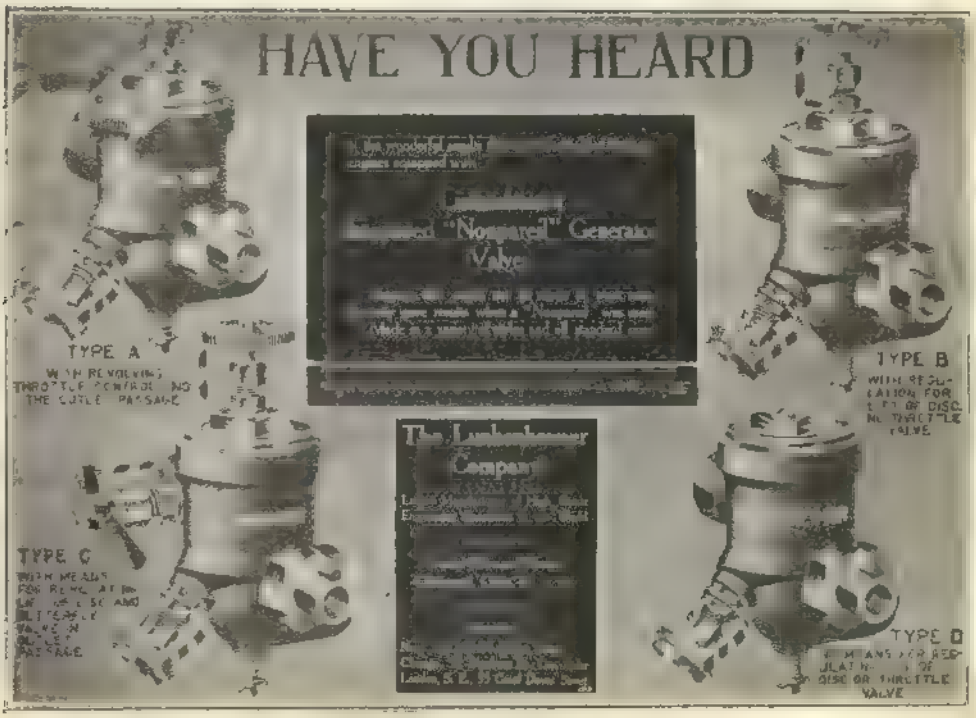
We have open territory for live progressive dealers who want a permanent business built on the growing popularity of the Glide.

Write today for 1909 agency contracts and proof that the Glide agency is the best proposition you were ever offered.

**GLIDE ROADSTER MODEL "R"—SAME CHASSIS—WHEEL BASE, 106 INCHES—36 x 4-in. TIRES ALL AROUND, with either CLOSE COUPLED BODY, seating four, or RUNABOUT BODY, seating two—$2,500**

**The Bartholomew Co., STANDARD MFRS., A. M. C. M. A., 210 Glide St., Peoria, Ill.**

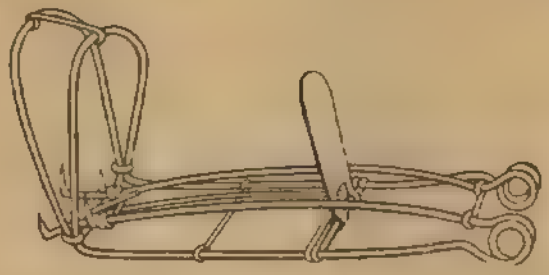
---



# Traps

GOPHER

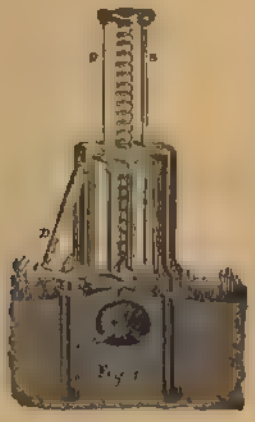
| | Per Doz. |
|---|---|
| Macabee | $ 3.00 |



| | Per Doz. |
|---|---|
| C. V.–Improved Two Ring | $ 3.00 |

All above One Doz. in a Box

MOLE



| No. | Per Doz |
|---|---|
| 2–Olmstead–Mole | $24.00 |

One in a Box

# Fly Traps

| | Per Doz. |
|---|---|
| Balloon-Tinned Wire Gauze | $ 3.00 |

One Doz. in a Box

| | Per Doz. |
|---|---|
| Paragon–Cone Shape, 9 in. High Green Wire Gauze. | $ 4.00 |

# Bee Smoker

| | Per Doz. |
|---|---|
| Cold Blast | $18.00 |

# Fly Killers

Length, 18 in., Enameled Handle

| | Per Doz. |
|---|---|
| Bigelow | $ 1.75 |

One Doz. in a Display Box

# Mouse and Rat Traps

**Household-Mouse**..... Per Doz. $ 2.25
One Doz. in a Box

Tin Choker, Mouse

| | Per Doz. |
|---|---|
| 5 Hole | $ 1.75 |

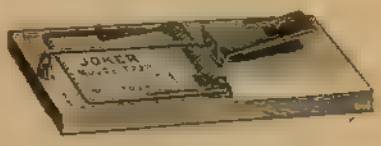
One Doz. in a Package

Wood Choker, Mouse

| | Per Doz. |
|---|---|
| 4 Hole | $ 1.20 |
| 5 Hole | 1.50 |
| 6 Hole | 1 80 |

| | Per Doz. |
|---|---|
| Out o'sight-Mouse | $ 1 25 |
| Out o'sight-Rat | 2 50 |

| | Per Doz. |
|---|---|
| Gee Whiz-Mouse | $ 0.75 |

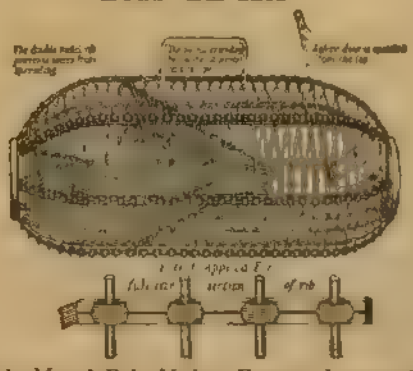



| No. | Per Doz. |
|---|---|
| 3-Joker-Rat | $ 1.75 |

One Doz. in a Box

| | Per Doz. |
|---|---|
| Holdfast-Mouse | $ 0.50 |

## HOLD-'EM RAT

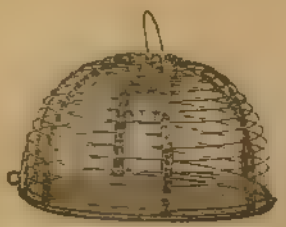


Double Metal Rib Makes Escape Impossible

| No. | Per Doz. |
|---|---|
| 1 15¼ in. Long, No. 17 Wire, 9 Ribs | $ 9.00 |
| 3-19 in. Long, No. 16 Wire, 9 Ribs | 12.00 |

One-half Doz. in a Crate

## MIDGET MOUSE



A Mouse once in is in to stay. Ribs being Automatically Slotted, the Mesh Wires are held Firmly in Place

| No. | Per Doz. |
|---|---|
| 10-5 in. Diameter, 3 in. High, No. 19 Coppered Wire, 6 Ribs | $ 2.00 |

One Dozen in a Package, One Gross in a Crate

AGAIN THE PERFECTED

# Great Chadwick Six

## IS VICTORIOUS

¶ At Indianapolis, Ind., on August 19th, it won the ten-mile free-for-all, defeating the 120 H. P. specially built Benz Racing Car, the Fiat, the six-cylinder National, and a most representative field. Time, 8 minutes, 23 seconds, which is the new world's record for a ten-mile track race.

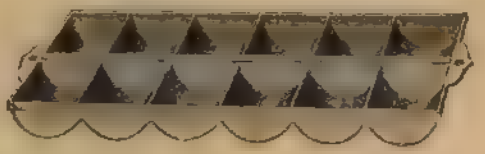
¶ Remember this record was made with a stock car, as were all the other victories of the PERFECTED GREAT CHADWICK SIX. The term "stock car" is often misleading and is used by many makers who build special racing machines for themselves and different cars for the public. We will sell anyone the car which wins the race or its exact duplicate at our catalog price, for it is our standard runabout and is identical with the cars sold to the public.

**Chadwick Engineering Works**
POTTSTOWN, PA.

# Gem Pans

**Cast Iron, Extra Finished**

| No. | | Per Doz. |
|---|---|---|
| 5 | Size 12x7¼ in., Cakes 3¼x2⅛x1¼ in. Deep | $ 4 00 |
| 8 | Size 12¼ x6¼ in., Cakes 3 in. Diam. x ⅞ in. Deep | $ 4.00 |



| No. | | Per Doz. |
|---|---|---|
| 10 | Size 10⅛x7½ in., Cakes 2¾ in. Diam. x1¼ in. Deep | $ 5 00 |
| 11 | Size 11⅝x6¾ in., Cakes 3x1⅝x⅞ in. Deep | $ 4 00 |

# Waffle Irons

**Cast Iron, Extra Finished**

**Regular Style**

| No. | Diam. Pans | Diam. Bottom of Ring | Per Doz. |
|---|---|---|---|
| 7 | 6¾ in. | 8¾ in. | $14 00 |
| 8 | 7¾ in. | 9⅛ in. | 16 00 |

**Deep Ring**

| No. | Diam. Pan | Per Doz. |
|---|---|---|
| 7 D | 6¾ in. | $17.00 |
| 8 D | 7¾ in. | 19.00 |

Specially Adapted for Gas or Vapor Stoves

# Deep Long Pans

**Cast Iron, Extra Finished**

| No. | Length | Width | Depth | Each |
|---|---|---|---|---|
| 7 | 15¼ in. | 6¼ in. | 1¾ in. | $ 0 60 |
| 8 | 17 in. | 7⅛ in. | 1¾ in. | .70 |

Above are Inside Measurements

# Long Griddles

**Cast Iron, Extra Finished**

| No. | Length | Width | Each |
|---|---|---|---|
| 7 | 16½ in. | 7¼ in. | $ 0 60 |
| 8 | 19 in. | 8¼ in. | 72 |
| 9 | 21 in. | 9 in. | 90 |
| 10 | 24½ in. | 12⅛ in. | 1 35 |

# Griddles

Cast Iron, Polished

With Bail

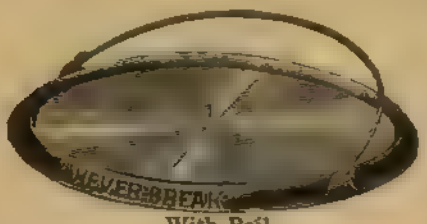
With Handles

| No. | Top Diam. | Each |
|---|---|---|
| 12– | 11¼ in | $ 0.70 |
| 14– | 13¼ in | .90 |
| 16– | 15¼ in | 1.10 |

| No. | Top Diam. | Each |
|---|---|---|
| 7– | 8¼ in | $ 0.36 |
| 8– | 9⅛ in | .40 |
| 9– | 10¼ in | .48 |
| 10– | 11¼ in | .62 |

NEVER BREAK

Stamped Steel, Polished




With Bail

With Handles

| No. | Top Diam. | Each |
|---|---|---|
| 112– | 12 in | $ 1.00 |
| 114– | 13 in | 1.15 |
| 116– | 14 in | 1.30 |

| No. | Top Diam. | Each |
|---|---|---|
| 18– | 9 in | $ 0.60 |
| 19– | 10 in | .70 |
| 110– | 11 in | .80 |

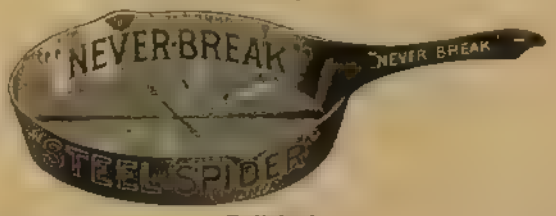
# Spiders or Skillets

CAST IRON

Polished

| No. | Top | Bottom | Depth | Each |
|---|---|---|---|---|
| 6– | 8⅜ in. | 7½ in. | 2 in | $0 43 |
| 7– | 9⅜ in. | 8¼ in. | 2⅛ in | .46 |
| 8– | 10⅜ in. | 8⅞ in. | 2¼ in | .50 |
| 9– | 11¼ in. | 9¾ in. | 2⅜ in | .58 |
| 10– | 11¼ in. | 10¼ in. | 2¼ in | .74 |

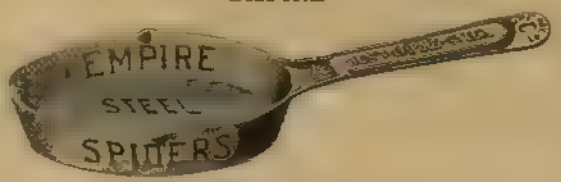
NEVER BREAK, STEEL




Polished

| No. | Bottom Diam. | Each |
|---|---|---|
| 7– | 8 in | $ 0.65 |
| 8– | 9 in | .75 |
| 9– | 10 in | .90 |
| 10– | 11 in | 1.10 |
| 12– | 12 in | 1.30 |

EMPIRE




Steel, Cold Handles, Polished

| No. | Bottom Diam. | Each |
|---|---|---|
| 7– | 8 in | $ 0.65 |
| 8– | 9 in | .75 |
| 9– | 10 in | 90 |

| No. | Bottom Diam. | Each |
|---|---|---|
| 10– | 11 in | $ 1.10 |
| 11– | 12 in | 1.30 |

THE 1909 LINE OF

# Reliance Motorcycles

will consist of five models, three of the single cylinder type and two of the double cylinder type. Anyone who is interested in the best motorcycle proposition of the year will please write for literature.

RELIANCE MOTOR CYCLE CO.
OWEGO, N.Y.

BRAZIRON FOR A AND J BRAZING CASTIRON
A NEW REPAIR HANGER
Adjustable for Width
Diameter
One Hanger fits all,
whose
Write
THE A. & J. MFG. CO.
26 W. Randolph St., CHICAGO, ILL.

F.A. BAKER & CO.
MOTORCYCLE SUPPLIES
SEND FOR CATALOGUE
37 Warren St., New York

Motorcycle Accessories
Send for largest and most complete catalogue ever issued. Indian & Harley-Davidson Motorcycles, $50 Up.
F. B. Widmayer Company, 2312 Broadway New York City

SPROCKETS
for Bicycle and Motorcycle
WE MAKE 90 PER CENT OF THE SPROCKETS USED
THE PARISH & BINGHAM CO.
Cleveland, Ohio

who would think of building Bicycles, Coaster Brakes, Lawn Mowers, Sewing Machines and etc., etc., without using The STAR BALL RETAINERS therein?

WHO tell us!

THE STAR BALL RETAINER CO.
LANCASTER PA. U.S.A. and
SHEFFIELD ENGLAND

Winner of the Only Diamond Medal, 1908
F. A. M. Endurance Run

The 1909
Harley-Davidson
better than ever
SEND FOR CATALOGUE

HARLEY-DAVIDSON MOTOR COMPANY
MILWAUKEE

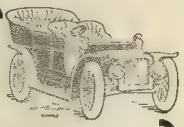
THE "KENO CONNECTION"
is the best pump nipple ever made. One sample for 15c.
Stevens & Co.
98 Chambers St., New York City, N. Y.

TORPEDO MOTORCYCLES
Torpedo stands for Quality and Quality means Price
Buy a Torpedo and get both. Write for Catalog
We make the following Models for 1909:

| | |
|---|---|
| Model B | $190 00 |
| " C | [illegible] |
| " G | 250 00 |
| " F Twin Cylinder | 275 00 |

Hornecker Motor Mfg. Co., Geneseo, Ill., U.S.A.

# Lubrication Costs Less Than Repairs



Most of the bills for automobile repairs are really the cost of faulty lubrication in disguise. The grade of Vacuum MOBILOIL specially prepared for your particular car will give perfect lubrication and save time, trouble and money.

VACUUM

# MOBILOIL

is made in six different grades. One of these is the right grade for you. The requirements of your car have been exactly determined, and this grade of MOBILOIL prepared for it with scientific precision.

*Send for booklet listing every automobile made and the grade of MOBILOIL prepared for it. Thereafter you need only watch the label on the can; the car will take care of itself. The book is free; its facts on the science of lubrication are invaluable. Gives track records to date, and other points motor painters.*

MOBILOIL, in barrels and in cans with patent pouring spout, is sold by dealers everywhere. Manufactured by

**VACUUM OIL CO., Rochester, N. Y.**

# YOU CAN NOT AFFORD TO USE UNRELIABLE LAMPS.

## HAM'S COUPE

**The Handsomest and Best Burning Small Square Lamp on the Market. A Very Attractive Design.**

# HAM'S LAMPS

## are always Reliable

They are built on the Ham Perfect "cold blast" principle, which insures a clear, steady, white light, that will not blow out in the strongest winds, or jar out on rough roads.

They are beautiful in design and finish. An ornament to any car, to give it the artistic finish.

We have a very attractive proposition to offer Manufacturers of, and Dealers in Runabouts and High Wheel Automobiles.

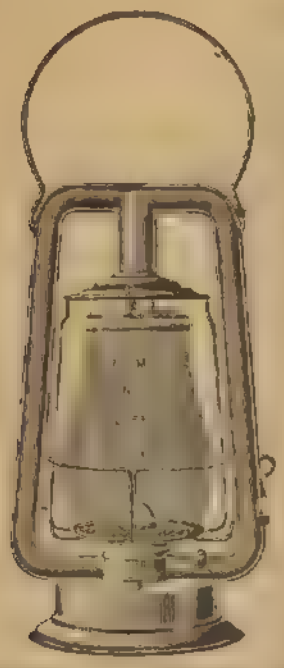
Write for particulars. Address "Dept. D."

## C. T. Ham Mfg. Company

## ROCHESTER :: N. Y.

# Tubular Lanterns

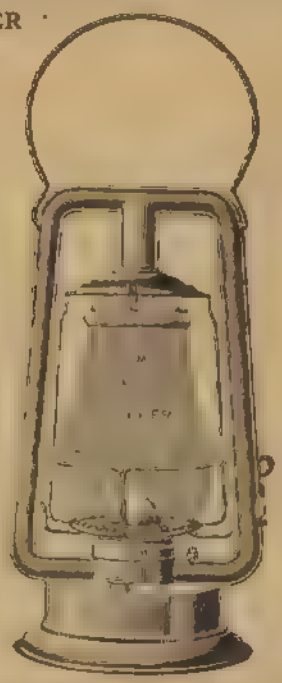
## HAMS CLIPPER



No. 1 Burner, ¾ in. Wick, No. 0 Globe

| No. | Per Doz. |
|---|---|
| 0–Clipper, Side Clipper Lift | $ 9.50 |

Gross Weight Doz., 36 lbs



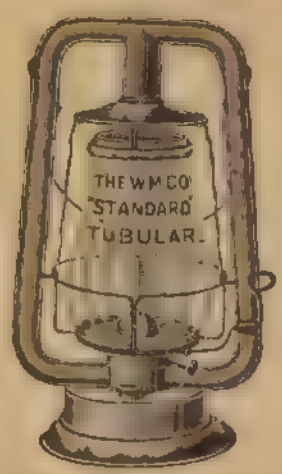
No. 2 Burner, 1 in. Wick, No. 0 Globe

| No. | Per Doz. |
|---|---|
| 2–Clipper, Side Clipper Lift | $13.00 |

Gross Weight Doz., 40 lbs.

All One Dozen in a Case

## WINFIELD STANDARD




No. 1 Burner, ¾ in. Wick, No. 0 Globe

| No. | Per Doz. |
|---|---|
| 0–Standard Side Lift | $ 9.50 |

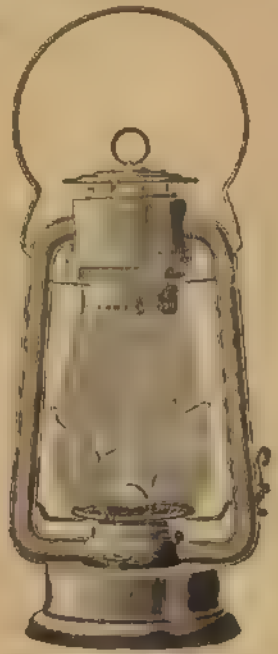
Gross Weight Doz., 36 lbs.

## HAMS COLD BLAST

No. 1 Burner, ¾ in. Wick, No. 0 C B Globe

| No. | Per Doz. |
|---|---|
| 1–Cold Blast, Side Lift | $13.50 |

Gross Weight Doz. 44 lbs.



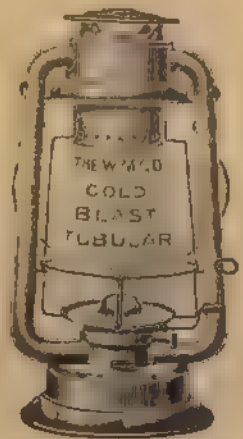
No. 2 Burner, 1 in. Wick, No. 0 C B Globe

| No. | Per Doz. |
|---|---|
| 2–Cold Blast, Side Lift | $16.00 |
| 2–Cold Blast, Copper Fount | |
| 22–Cold Blast, Large Fount Burns 36 hours. | 17.50 |

Gross Weight Doz., 46 lbs.

No. 2 Cold Blast, One-half Doz in a Case. Balance One Doz.

## WINFIELD COLD BLAST



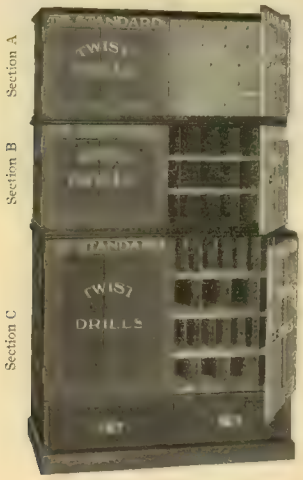

No. 2 Burner, 1 in. Wick, No. 0 C B Globe

| No. | Per Doz. |
|---|---|
| 2–Cyclone, Cold Blast, Side Lift | $15.00 |

Gross Weight Doz., 44 lbs.

# SECTIONAL DRILL CASES

Fig 479A




## Section A

This Case is 43 inches wide, 30 inches high, and 14½ inches deep, outside measurement, and is provided with drawers for holding Wire Gauge and Jobbers' Drills, the two large drawers are immediating surplus stock or other tools. The small drawers in this section are fitted with adjustable partitions, providing a flexible arrangement covering from 100 to 120 available spaces according to the sizes and quantities carried.

## Section B

This Case is 36 inches wide, 18 inches high, and 14½ inches deep outside measurement, and is designed for any style of Drills not longer than 12⅛ inches. Removable metal partitions sliding into grooves provide a flexible arrangement of 45 to 65 available space according to the sizes and quantities carried.

## Section C

This Case is 43 inches wide, 32 inches high, and 19½ inches deep, outside measurement, and is designed for a general assortment of Drills (except Wire and Jobbers') up to 2½ inches in diameter. The vertical partitions are removable, the same as in Section B, making the space for each size flexible and providing a maximum capacity of 64 spaces. The two large drawers can be utilized for Sockets, Chucks or other tools.

These Cases are made of Quarter Sawed Golden Oak with paneled doors and ends.

Prices on application.

# HARTFORD

THE HARTFORD CLINCHER TIRE

## The TIRE THAT LASTS

EVERY tire, no matter how poor, has its patrons and its partisans; but the one true tire test is—time and travel.

¶ Find, among your friends, the old and experienced motorists—men who have driven cars for four, five or six years, and tried, perhaps, every prominent tire produced. ¶ In the majority of cases you'll find them committed beyond the possibility of change to

# HARTFORD TIRES

*"The Tires That Last"*

¶ There's a definite, concrete reason for this—partially expressed in the phrase "the tire that lasts."

¶ Hartford Tires do last—because they are designed right to begin with; because the heavy tread is compounded exactly right; because the fabric is specially woven Sea Island Cotton; because the cushion is absolutely pure Para; because Hartford Inner Tubes are made to fit without folding, straining or wrinkling, which means durability impossible in a tube vulcanized on a straight mandrel.

¶ If you are inexperienced on tires or dissatisfied with your experience, consult those who have driven long and hard almost inevitably they will direct you to the Hartford Tire—the tire that lasts. Ask for Hartford Clincher Tires and Tubes on your new car or try a set the next time you renew. ¶ We endorse and recommend all automobilists to equip their cars with Standard Universal Quick Detachable Rims.

## THE HARTFORD RUBBER WORKS CO., Hartford Conn.

BRANCHES New York 56th St. & Broadway Chicago, 47th St. & Michigan Ave., Boston 847 Boylston St. Detroit, 256 Jefferson Ave.
Denver, 2nd Broadway Philadelphia, 425 Vine St. Atlanta Ga., 94 North Pryor St. Buffalo, 726 Main St., Cleveland 1831 Euclid Ave.
AGENCIES: Pierson Wilcox Electric Co. Minneapolis Mercantile Lumber & Supply Co., Kansas City Standard Tire
Agency, St. Louis, Mo., Chamberlin & Lyon Motor Supply Co. 930 S. Main St., Los Angeles Cal. 514 Golden Gate
Ave. San Francisco Cal. P. P. Keenan Co., Portland, Ore. Compania Mexicana de Vehiculos Electricos City of Mexico

# 1910 HART-KRAFT 1910

## COMMERCIAL POWER WAGONS

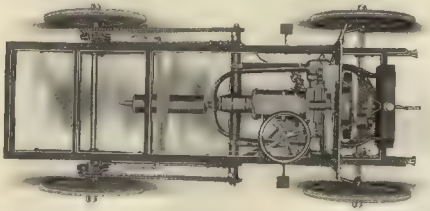
Unit Power Plant
Magneto Ignition
Timken Bearings
Planetary Gearing
Multiple Disc Clutch
Double Opposed Motor
Water Cooled
Full Elliptic Springs
Double Chain Drive
Solid Tires

All parts of the Power Plant are easily accessible from the Driver's Seat

Special Bodies of Selected Design made to suit Customers

Capacity: 1000 pounds

**THE HART-KRAFT MODEL B** is the highest grade Motor Wagon chassis ever produced. It is for the man who wants a High Class Motor Wagon—one that will deliver his goods DAILY at a much reduced cost—the specialty of a factory that produces only Power Wagons of 1000 pounds capacity.



## HART-KRAFT MOTOR COMPANY

YORK, PENNA.

# Heddon's Killer Minnows

## FOR UNDER-WATER FISHING

Made of selected stock and coated with from eight to twelve coats of Porcelain Enamel. Each Minnow is mounted with treble hooks and Nickel Plated spinners and connections. The spinners revolve in opposite directions, which prevents the bait from turning and the necessity of using a swivel.

Cut shows two-thirds actual size.

**Fitted with two side and one tail treble hook**

| No. | Per Box |
|---|---|
| **3000**—3 inch Body, Green Back, White Sides and Belly | $7 50 |
| **3001**—3 inch Body, Green Back, Red Sides and White Belly | 7 50 |
| **3002**—3 inch Body, Red Back, Yellow Sides and Belly | 7 50 |

Cut shows two thirds actual size.

**Fitted with four side and one tail treble hook**

| No. | Per Box |
|---|---|
| **5000**—3½ inch Body, Green Back, White Sides and Belly | $8 50 |
| **5001**—3½ inch Body, Green Back, Red Sides and White Belly | 8 50 |
| **5002**—3½ inch Body, Red Back, Yellow Sides and Belly | 8 50 |

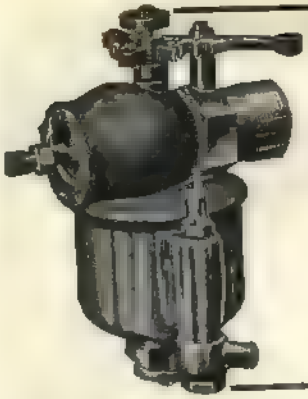
Packed one in a box, one dozen in a carton

# Salmon Eggs

## NO. 100 TYEE PREPARED SALMON EGGS

These eggs are specially prepared and guaranteed to have no poisonous substances used in preparing them.
Packed one dozen cans in box. Weight 4 lbs. per dozen.

| No | | Per Doz |
|---|---|---|
| **100–Tyee Prepared Salmon Eggs** | . . . . . | $3 00 |



# HEITGER Model C, 1909 CARBURETER

Has mechanical as well as automatic control of gasoline feed, operated by throttle, by a simple reliable and durable construction

No cams, or delicate levers to adjust, or get out of order. Improved float adjustment float valve, and air valve. Has gauze strainer at gasoline connection. New spray nozzle, making starting easy, and low gasoline consumption

Specially adapted to all types, two-cycle engines.

*Agents Wanted Everywhere*

HEITGER CARBURETER CO

**203 West South Street, - INDIANAPOLIS, IND.**

*Special types for Buick & Ford Runabouts*

For the convenience of customers desiring immediate delivery stocks of Shelby Seamless Steel Tubing are kept in many large cities. The location of stock nearest to any specified point will be advised on request.

**District Sales Offices**

ATLANTA
CHICAGO
DENVER
NEW ORLEANS
NEW YORK
PHILADELPHIA
PITTSBURGH
PORTLAND
SAN FRANCISCO
ST. LOUIS
SALT LAKE CITY
SEATTLE

# LAMP BRACKETS of CAST STEEL

**CHEAPEST AND BEST**

Bent Cold

Furnished plain as per cut, or with stub threaded and fitted with nut and washer ready for attaching. Can also furnish special stub attachment to fit any car, or cast with special solid stub

**JAPANNED, BRASS OR NICKEL PLATED**

**WE ALSO MANUFACTURE AUTOMOBILE CASTINGS OF CRUCIBLE STEEL**

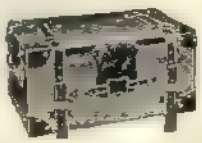
*Please write us before making your contract*

**CHICAGO STEEL FOUNDRY COMPANY, Chicago, Ill., U. S. A.**

# The Marvin Auto Tire Trunk

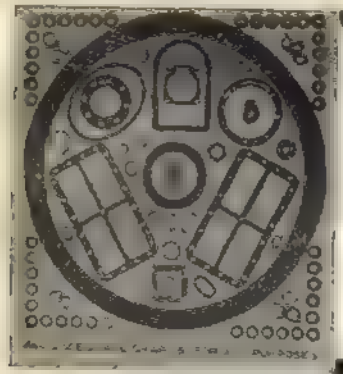
## "The Wonder of the Twentieth Century"

Our trunks are made of the **best material**, are **beautifully finished**, durable and sold by us at **prices far below** those of any other concern in the U. S.



Assure yourself of the correctness of the above by sending for samples

**THE MARVIN AUTO TRUNK CO., Office, 68 Thomas St., N. Y.**




# "RIGHT" GASKETS

are made RIGHT and have the RIGHT material in them.

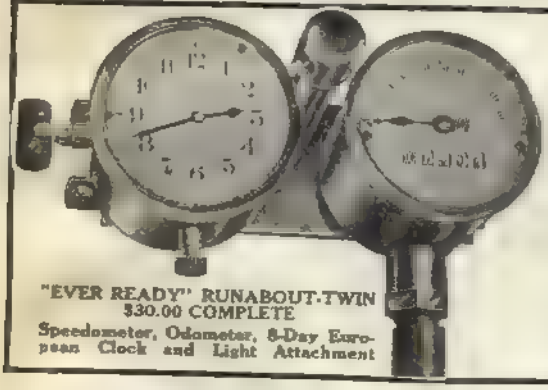
# GASKETS

for Cylinder Heads, Spark Plugs, Valve Cages, Intake and Exhaust Couplings, Crank Cases, etc.

Send us Sketch with Quantity Required and get our best Prices

**THE GASKET SUPPLY CO.**

1510 SANSOM STREET, PHILADELPHIA

"EVER READY" RUNABOUT-TWIN
$30.00 COMPLETE
Speedometer, Odometer, 8-Day European Clock and Light Attachment


# "EVER READY" 1909 SPEEDOMETERS

ABSOLUTELY GUARANTEED

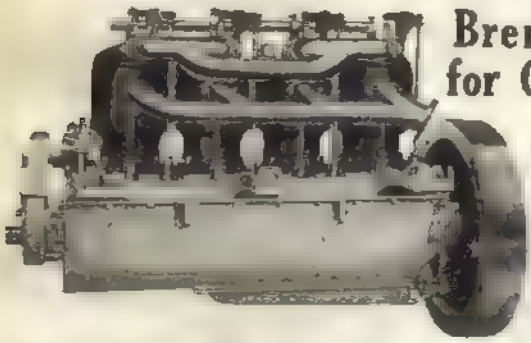
Twelve models, from $15.00 to $45.00 in price. The most satisfactory speedometers for dealers and owners.

**AUTO IMPROVEMENT CO.**

304-322 Hudson St. NEW YORK

319 Columbus Ave., BOSTON

775 Folsom St., SAN FRANCISCO


# Brennan Standard Motors for Commercial Cars

We are handling a special motor for commercial use which can be easily installed in any type of car. We guarantee it to be one of the quietest and most powerful as well as one of the most reliable motors on the market. It has all the excellent points of the pleasure car type and you know that for years BRENNAN STANDARDS have been used by many of the leading manufacturers. May we send you further particulars? Made in the following sizes

**4-Cylinder, 1909, special vertical, 4⅛ x 4, 4⅛ x 5.**

**4-Cylinder, vertical, 5 x 5.**

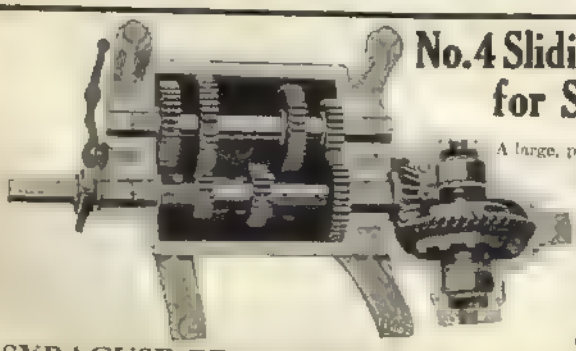
**4-Cylinder, vertical, 5½ x 6, also 6 x 6, and 7 x 6. 6 cyl., 4⅛ x 5.**

We also build 2 cylinder horizontal motors, in the following sizes

**2-Cylinder, 1909 special horizontal opposed, 5 x 5 annular ball bearings and 4⅛ x 5**

**2-Cylinder, horizontal opposed 5 x 5, annular ball bearings.**

**Brennan Motor Mfg. Co., Syracuse, N. Y.**


# No. 4 Sliding Gear Transmission for Side Chain Drive

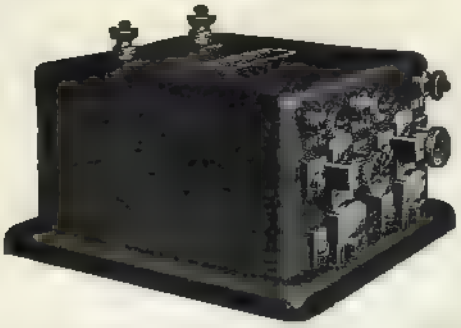
A large, powerful transmission, built for the heaviest types of cars—either pleasure or commercial. We also furnish planetary transmission gears in three sizes for shaft or chain drive; selective type transmission in three sizes and Progressive type sliding gear transmissions for shaft or chain drive.

Can furnish hand levers for operating transmission and brake.

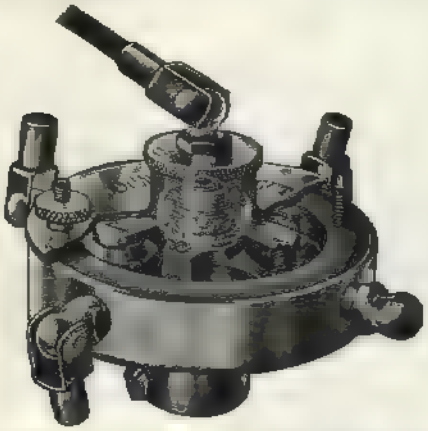
Get our prices. They will prove interesting.

SYRACUSE GEAR COMPANY - - - SYRACUSE, NEW YORK

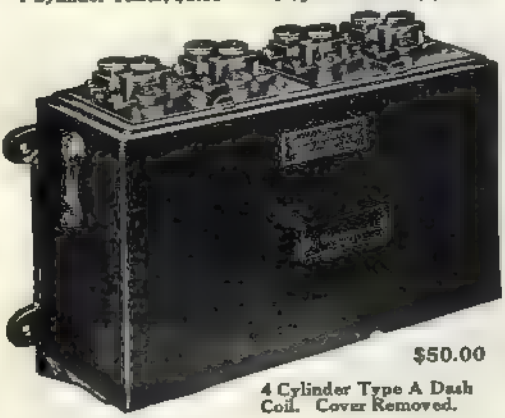
# CONNECTICUT



Two Cylinder Special Marine Box Coil, - $18.00
Single Cylinder, - - - - - - - - 9.00



4 Cylinder Timer, $8.50 6 Cylinder Timer, $8.50



$50.00
4 Cylinder Type A Dash Coil. Cover Removed.

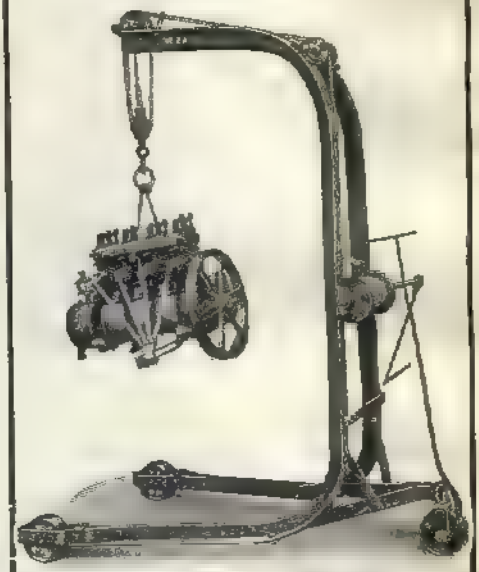
Secondary Terminals, 20c each. Primary, 15c each.

*SEND FOR CATALOG 14-C*

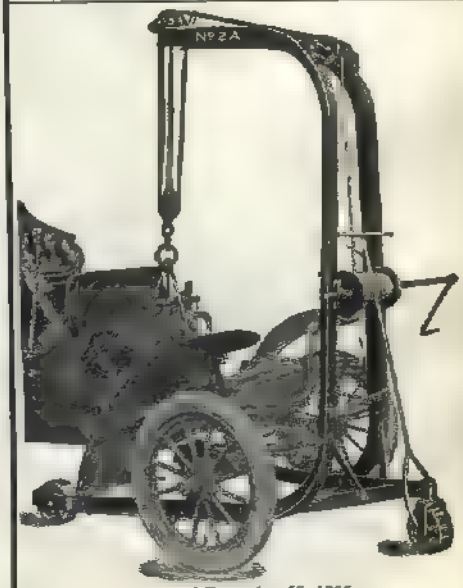
*Licensed under the Unit Coil Co.'s patents*

**CONNECTICUT TEL. AND ELECTRIC COMPANY, INC.**
30 BRITANNIA ST. - - MERIDEN, CONN.

# HERCULES
## Portable Crane Hoist



## AUTOMOBILE Low-Down PATTERN




Patented December 19, 1905.

See how easy it does it. Fills the bill for Automobile Factory and Garage Crane. Hundreds are using them.

Stock sizes, 1000 and 2000 pounds capacity. Larger made on order.

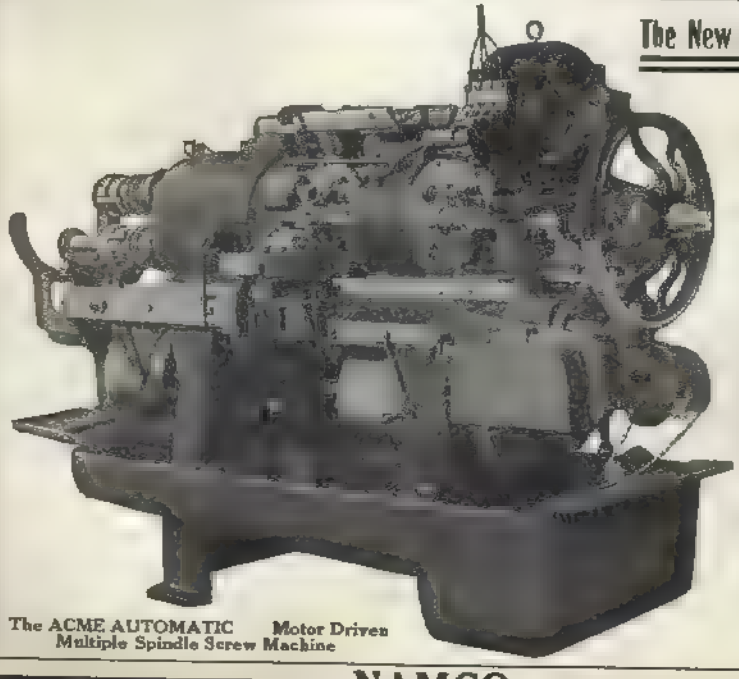
**WILLIAM S. NICHOLLS**
252 BROADWAY NEW YORK

# BABCOCK ELECTRICS

are the PAR EXCELLENCE of electric carriage manufacture. They are luxury, elegance and economy combined. They are ideal for ALL members of the family and for all occasions. Let us prove to you that BABCOCKS are the greatest electrics. Send us your name.

BABCOCK ELECTRIC CARRIAGE CO. - Buffalo, N. Y.

NAMCO



The New Single Drive

is
More Powerful
More Productive
More Convenient
More Economical
Easier Handled
Safer

*Power is applied with one belt or one motor*

The National-Acme Mfg. Company
CLEVELAND, OHIO
Branch Offices
New York
Boston
Chicago
Atlanta

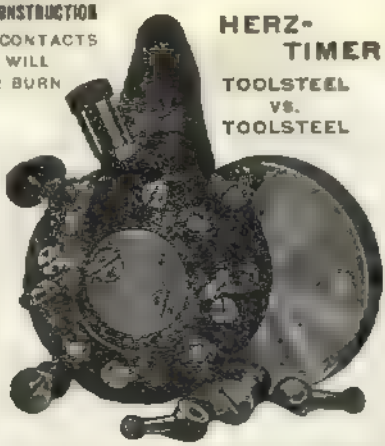
The ACME AUTOMATIC Motor Driven Multiple Spindle Screw Machine

NAMCO

HERZ HERZ HERZ

1910 CONSTRUCTION
NEW CONTACTS THAT WILL NEVER BURN OFF.

HERZ-TIMER
TOOLSTEEL VS. TOOLSTEEL



SAVES 35 PER CENT ON CURRENT. DOUBLE BALL BEARINGS. 12 DIFFERENT TYPES. NEW REDUCED PRICES FOR 1909.

HERZ-PLUG
"BOUGIE MERCEDES"

NO PORCELAIN

DOUBLE STONE

THE BEST VALUE IN SPARK PLUGS EVER OFFERED.

ABSOLUTELY SELF CLEANING

IMPOSSIBLE TO FOUL

NOT AFFECTED BY OIL

ABSOLUTELY GUARANTEED FOR ONE YEAR
New Magneto Type! All One Price, $1.50

FOR 15 YEARS THE STANDARD

HERZ

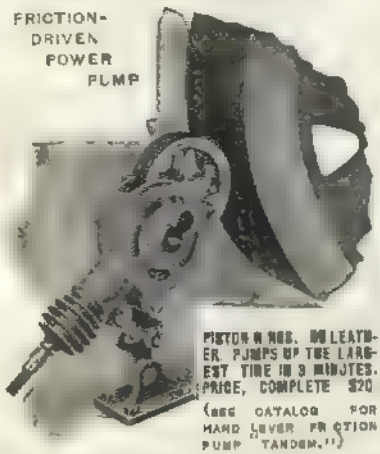
IN EUROPE AND AMERICA

ASBESTOS COPPER GASKETS

LARGEST STOCK IN AMERICA
1200 SIZES

SPECIAL IGNITION CABLE AND WIRE

THE "UNIVERSAL"
FRICTION-DRIVEN POWER PUMP



PISTON 4 INS. NO LEATHER. PUMPS UP THE LARGEST TIRE IN 3 MINUTES. PRICE, COMPLETE $20

(SEE CATALOG FOR HAND LEVER FRICTION PUMP "TANDEM.")

HERZ-DISTRIBUTOR

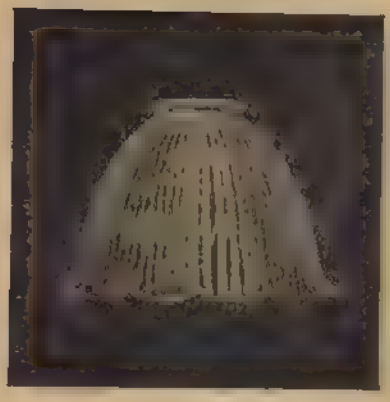
A PRECISION INSTRUMENT MADE OF TOOL-STEEL RUBBER AND METAL; MOST EXQUISITE WORKMANSHIP. NEW REDUCED PRICES FOR 1909.

PARIS VIENNA HERZ & CO. CIVIL ENGINEERS PUCK BUILDING Cor. Lafayette & Houston Sts. NEW YORK

FREE OUR "IGNITION BOOK." WRITE FOR IT.

HERZ HERZ HERZ

# High Efficiency Holophane Reflectors



Extensive Style

Focusing Style

## TABLE SHOWING STYLES OF REFLECTORS RECOMMENDED FOR USE WITH VARIOUS LAMPS

| Gem Watt | Tantalum Watt | Mazda Watt | Extensive Type | Intensive Type | Focusing Type | Type of Holder |
|---|---|---|---|---|---|---|
| 40-50 | 40 | 25 | E 3 | I 3 | F 3 | Skirted Base–H<br>Edison Reg. Base–O |
| 80 | .. | 40 | E 5 | I 5 | F 5 | Skirted Base–H |
| 100 | 80 | 60 | E 7 | I 7 | F 7 | Edison Reg. Base–O |
| 125 | .. | 100 | E 9 | I 9 | F 9 | H |
| - | .. | 150 | E 11 | I 11 | F 11 | H |
| - | - | 250 | E 13 | I 13 | F 13 | A |
| No. 1 Meridian | No. 1 Meridian | No. 1 Meridian | Reflector | M 40 | ..... | H |
| No. 2 Meridian | No. 2 Meridian | No. 2 Meridian | Reflector | M 60 | ..... | H |

## PRICE DATA

| Type No. | Standard Quantity | Number in Package | Weight per Package, Lbs. | Price Each | Size Holder |
|---|---|---|---|---|---|
| E 3 | 40 | 20 | 28 | $1.30 | O |
| E 5 | 30 | 10 | 19 | 1.45 | O |
| E 7 | 30 | 10 | 23 | 1.56 | H |
| E 9 | 30 | 10 | 32 | 2.10 | H |
| E 11 | 20 | 10 | 54 | 4.35 | A |
| E 13 | 12 | 6 | 51 | 5.36 | A |
| F 3 | 40 | 20 | 35 | 1.41 | O |
| F 5 | 30 | 10 | 24 | 1.56 | O |
| F 7 | 30 | 10 | 29 | 1.89 | H |
| F 9 | 30 | 10 | 34 | 2.33 | H |
| F 11 | 20 | 10 | 54 | 4.35 | A |
| F 13 | 12 | 6 | 45 | 5.36 | A |
| I 3 | 40 | 20 | 34 | 1.41 | O |
| I 5 | 30 | 10 | 25 | 1.56 | O |
| I 7 | 30 | 10 | 28 | 1.89 | H |
| I 9 | 30 | 10 | 35 | 2.33 | H |
| I 11 | 20 | 10 | 55 | 4.35 | A |
| I 13 | 12 | 6 | 48 | 5.36 | A |
| M 40 | 60 | 80 | 90 | .91 | H |
| M 60 | 40 | 40 | 85 | 1.36 | H |

| | Each |
|---|---|
| "O" Holders, Polished or Brush Brass, 2¼ inch Standard Quantity 30 | 18 cents |
| "H" Holders, Polished or Brush Brass, 2¼ inch Standard Quantity 30 | 26 cents |
| "A" Holders, Polished or Brush Brass, 3¼ inch, Standard Quantity 12 | 65 cents |

## PRICE ON SATIN FINISHING

For Satin Finish on Reflectors, add 10% to List.

# Standard Line Holophane Reflectors

"E"—Extensive Type

"F"—Po[illegible] Type

"I"—[illegible]

These New Reflectors are [illegible] Holophane Sill Prism which [illegible] efficiency.

## PRICES AND DATA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| E | 25 | 25 Watts | 40 | 20 | 28 lbs. | $1.31 | 2¼ in O |
| E | 40 | 40 " | 30 | 10 | 19 " | 1.45 | 2¼ " O |
| E | 60 | 60 " | 30 | 10 | 23 " | 1 56 | 2¼ H |
| E | 100 | 100 " | 30 | 10 | 29 | 2 10 | 2¼ H |
| E | 150 | 150 " | 20 | 10 | 54 | 4 35 | 3¼ A |
| E | 250 | 250 " | 12 | 6 | 51 | 5 36 | 3¼ " A |
| I | 25 | 25 | 40 | 20 | 34 | 1 31 | 2¼ O |
| I | 40 | 40 | 30 | 10 | 25 | 1 45 | 2¼ O |
| I | 60 | 60 " | 30 | 10 | 28 " | 1 56 | 2¼ " H |
| I | 100 | 100 " | 30 | 10 | 29 | 2 10 | 2¼ H |
| I | 150 | 150 " | 20 | 10 | 54 " | 4.35 | 3¼ A |
| I | 250 | 250 " | 12 | 6 | 51 | 5 36 | 3¼ A |
| F | 25 | 25 " | 40 | 20 | 35 | 1.31 | 2¼ " O |
| F | 40 | 40 | 30 | 10 | 24 | 1.45 | 2¼ " O |
| F | 60 | 60 " | 30 | 10 | 29 | 1 56 | 2¼ H |
| F | 100 | 100 " | 30 | 10 | 30 | 2 10 | 2¼ H |
| F | 150 | 150 " | 20 | 10 | 55 | 4 35 | 3¼ A |
| F | 250 | 250 | 12 | 6 | 15 | 5 36 | 3¼ " A |
| [illegible] | 40 | 40 W Meridian | 60 | [illegible] | 20 | 91 | 2¼ H |
| [illegible] | 60 | 60 " " " | 30 | 10 | 85 " | 1 56 | 2¼ " H |

## PRICE ON SATIN FINISHING

For Satin Finish on Reflectors, add 10% to List.

## HOLDERS FOR USE WITH HOLOPHANE REFLECTORS

| Style | Diameter | Finish | Standard Quantity if shipped without Shade | List Price, Each |
|---|---|---|---|---|
| A | 3¼ inch | Polished or Brush Brass | 12 | $0.65 |
| H | 2¼ " | Polished or Brush Brass | 30 | .26 |
| O | 2¼ " | Polished or Brush Brass | 30 | .18 |

Other Finishes furnished on Special Order only.

# COUNT OR PENNY GOODS.

**School stores and all others** who want the penny trade, can find no better selection in the country than we show of these profit bringing goods. Our line is always up to date and new additions come in every month. *100 in box, unless specified.*

Boxes 300 in box.
...ond. Peach Stones, 400 in box.
...Penny Ice Cream
...h shredded cocoanut in

Y328 Peanut Square, ... 52½
Monkeys 300 in box 52½
Y816. Black Jaw Breakers, 1000 in box. 5½

...Chocolate Italian Lozenge 100 in box. 50

...3/8 Fruit Jap Drops, 100 in box. 50

**Licorice Specialties.**

Y356. Licorice Bricks. 1200 in box .....
Y357. Licorice Whips. 100

...piece, 2 sets of lines of al...
...nations in each box.
Y378. Licorice Drop. 500 in box.

**Chocolates.**

Y491. Chocolate Jelly Bees. Chocolate ... Rounded
Y494. Ch...

...and half walnut, chocolate coated. 100 in box .....
Y663 Chocolate Dipped Walnuts. ½ Walnut chocolate coated.
Y665. Chocolate Drops.
Y666 Chocolate Gems.
Y824 Chocolate Dipped C...

...peanut bar. 200 in box .....

CHOCOLATE HONEY COMB CAKES

Honey Comb Cakes —Molasses sponge dipped in chocolate. 100 in box.

**Marshmallow Line.**

Y843. Marshmallow Banana 100 in box.
Y567. Midget Scraps. Marshmallow drops 10 lbs in box. 1000 in box

**"TWIRLERS"**

*The latest fad. Sell like hot cakes*

Y876—"A slight day suckey." Penny ice cream cone filled with hard candy, in 3 flavors and colors. **55c**

Y610. Bulls-Eyes, 200 count
Y614. Klondyke Nougat, 400 ...
Y2.0. Orange Ball. 300 in box.
Y200. Burnt Peanuts

Y859 Twin Caramels 8 for 1 cent, 2 large pieces mixed flavors .....
Y906. Jelly Raspberries, imitation of red raspberry in shape and color, highly flavored soft jelly center sell 8 for one ...

...Candy made of shredded French cocoanut. A famous confection.

...be
Y911. Penny Bars
...Fruit, 100 with pop
...100 in box ...
Y914. Transparent Fruit Table ...

**CANDY BILLY POSSUMS.**

*To sell for a penny. The most popular candy novelty on the market. Strike while the iron is hot.*

55c

**MARSHMALLOW SPECIALTIES.**

*Big penny pieces. Great summer sellers.*

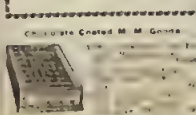
55c

Y674—Toasted Marshmallows, 1¾ x 3½ in Marshmallow Bars covered with toasted cocoanut.

**55c**

piece, 100 in box. Per box. **55c**

**Chocolate Coated M. M. Goods**



**"NUT PENNY PEANUT VENDING MACHINE.**

Y1120—Very simple and mechanically perfect Vender with one operation

**$7.00**

Write for our prices on 10...

...also made for nickels instead of pennies at same price. Specify if desired.

**SPANISH SALTED PEANUTS.**

Y840—High grade salt...
...Spanish ...
Y46—New crop, No. 1 Spanish ...ed, palatable and wholesome. 30 lbs to case.

**CHICAGO PEANUT VENDING MACHINE.**

...market, costs a little more but is worth the difference.

...everything on
...Each complete
...in case, **$10.00**

**"GEM-OEN BREATH PERFUME.**

Y49—Too well known to ... **$1.00**

# CHEWING GUM.

**This staple line is well represented here** ... the most ... are ... at ... ? ... to be ... and ...

**CHEWING GUM.**

Y87, "Ripe Fruit"—20 sq. pkgs (100 ... Box. 45c

Y87, Dutch Jim ... goods. All black, Licorice flavor, twenty 5c pkgs. in box (100 pieces). ... Box. 45c

Y88 Calumet Tutti ...

Y83, Yucatan Gum—Too ... description ... (Choice of ...

Y53, Adams' Pepsin Tutti ... pieces in box Box. 50c
Y69 Wrigley's ... Spearmint Gum—A very popular 5c... grade gum ... Box. 50c

Y90 ... Chewing ...

**Big Long Gum.**

...ed with pepper... mint. ... in box. Box. 50c

Y73, Bloodberry—Antiseptic. A very popular gum. B...

...Box. 50c

...sugar coated chew...

Y71, O.K. Pepsin Licorice mint flavor. 100 large ...

**Grove's Chicle Chewing Gum.**

Y85, No. 1 Pepsin—Foil wrapped, ...the ...

**B. B. GLASS JAR GUM ASST.**

...Jar free
Y76—B. B. Glass Jar Gum Assted. Flint rises ... with ... $1.25

**PREMIUM GUM ASSTS**

...handy ... Gum ... ning ...

Y27—"Good Value." Penny paraffine gum, packed 120 pcs and 120 jewelry novelties ...

...rope ... with every pkg. ...

**THE "PANSY" GUM MACHINE.**

Safest and neatest automatic salesman ever placed before the public
Y310—Sells gum at ... nickel, tells fortune and gives ... letter ... nickeled.

...pieces of gum per ... wood box. Each $3 50

**Gum for Above**

100 pcs in box. Box. **50c**

**TWO MONEY MAKERS**

Enough gum and chocolate included, to pay for the machines and leave a profit.
Gum ... Machines ...
...any store—stands 14½ ... high, black jack enameled base, all metal parts nickle plated gum protected by ...
Very durable nerve ...
$7 5
$1 0
...Vending Ma... $1 5
$1 2

# Decoys

| No. | | Per Doz |
|---|---|---|
| 22 | "Special" Wood, Duck Decoy, Glass Eyes, Teal, Canvasback, Mallard, Widgeon, Sprig and Blue Bill | $10 00 |
| 23 | "Challenge" Solid Wood, Duck Decoys, Canvasback Sprig and Mallard | 12 00 |
| 24 | "Challenge" Hollow Wood [illegible] Sprig and Mallard | 15 00 |
| 25 | Canvas, Collapsible, to inflate, [illegible] Mallard and Widgeon | 12 00 |
| 26 | Canvas, Collapsible, to inflate, Geese, [illegible] | 24 00 |

All Decoys Packed One Doz in Crate [illegible]

Decoy [illegible], 10 Canvas Decoys [illegible] Per Pair 60

# Game Carriers

No. 15

| No. | | Per Doz |
|---|---|---|
| 6 | Single Shoulder Piece, with Looped Thongs Tied in | $24.00 |
| 9 | Double Shoulder Piece, Split Thongs, Sewed in, Hand Made | 14.00 |
| 13 | Single Shoulder Piece, Split Thongs, Riv[illegible] and Sewed | 12 00 |
| 15 | Barnum Carrier, Capacity 18 Ducks, We[illegible] 2 ¼ oz | 3 50 |

# Whistles and Calls

Universal

Echo

| No. | | Per Doz. |
|---|---|---|
| 1 | Large, Nickel Plated | $ 4 00 |
| 2 | Medium, Nickel Plated | 3 50 |
| 3 | Small, Nickel Plated | 3 00 |

| No. | | Per Doz. |
|---|---|---|
| 620 | Nickel Plated | $ 3 00 |

White Bone

| No. | | Per oz |
|---|---|---|
| 90 | Large | $ 3 00 |
| 91 | Small | 2 50 |

Allen's Duck

Wood Shell, Metal Ends

Per Doz ..... $ 9.00

B. G. I. Duck

Cocabolo Wood, Metal Tip

| No. | | Per Doz. |
|---|---|---|
| 760 | | $ 6 00 |

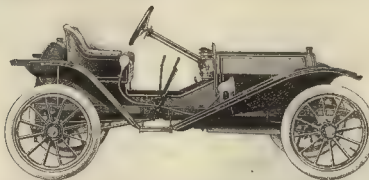
# FROM COAST TO COAST

## everybody says the same thing about the

# Hupmobile

4 cylinders
20 H. P.
Sliding gears
Bosch Magneto

# $750



## "The smartest and the best little car ever marketed in America at anything like the money"

What people are saying in your community about the Hupmobile they are saying in every other community from coast to coast

No other car has ridden so quickly into widespread popular approval.

Everybody has a good word for the Hupmobile — and nobody can find any room for criticism

It is the first small car ever built in this country that is in every way as good as the most expensive large car.

It is the first small car ever built in this country possessing real dash and individuality in design.

Most small cars are makeshifts in material, in construction and in design — the Hupmobile is just as good in proportion and just as smart in appearance as the finest big car.

If it were a large car, we could not afford to make it so good

And you can be absolutely certain, if you see a larger car advertised at an approximate price, that the manufacturer has skimped somewhere—either in material or workmanship.

A finer or better power plant you will not find in any car. Other engines are larger, but none is built of better materials or with more careful workmanship.

### SPECIFICATIONS

**ENGINE**—4 cyl., 20 H. P., 3¼ in bore, 3¼ in stroke, water cooled; offset crank shaft; fan bladed fly wheel in front; Parsons white bronze bearings, tubeless cam shaft.

**TRANSMISSION**—Selective sliding gears, shifting without noise

**CLUTCH**—Multiple disc type, running in oil

**REAR AXLE**—Shaft drive

**BRAKES**—Two foot and two emergency (internal expanding) lined with Thermoid on rear hubs

**IGNITION**—Bosch high tension magneto.

**TIRES**—30x3 inches

**WHEEL BASE**—86 inches.

**TREAD**—56 inches

**SPRINGS**—Semi-elliptical front, patented cross spring rear.

**EQUIPMENT**—Two side and tail oil lamps, dragon horn, tools, repair kit, pump.

**WEIGHT**—1100 pounds, regular equipment

The ignition equipment is the Bosch high tension magneto—the same as supplied on the costly large cars. And the Hupmobile is the **only** small car equipped with this world famous magneto without extra charge.

It is the same way throughout—in the sturdy strength of the axles, the pressed steel frame the noiseless sliding gears there is not a single point on which just criticism can be made.

If you can afford to maintain two cars one of them should by all means be a Hupmobile

And if you do put a Hupmobile in your garage alongside of your big car, you will find that involuntarily you will turn to it ten times to the once you use the larger one.

On the other hand, if you can have but one car, the Hupmobile's obvious advantages low first cost and low cost of maintenance—will appeal to you all the more strongly

Get in touch at once with the Hupmobile dealer nearest you, and write for the literature

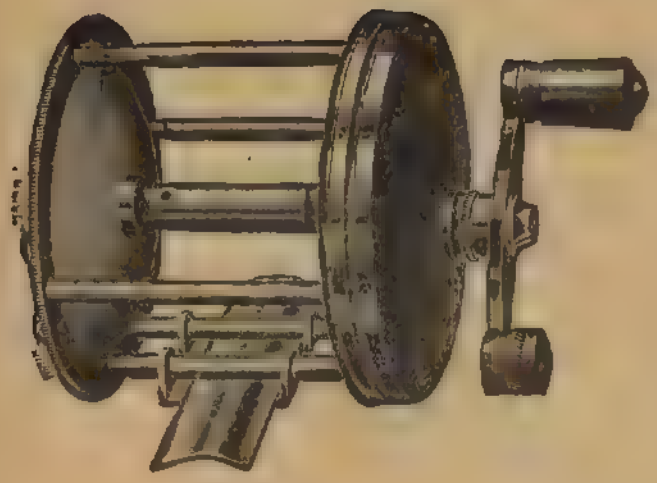
**On the Brighton Beach track, August 27, the $750 Hupmobile defeated two S. T. O. French cars, listing at $2,100; one Allen-Kingston, $3,000, and one Mitchell, $2,000, in the six hour race, covering 226 miles.**

# Hupp Motor Car Company

DEPT. A
DETROIT, MICHIGAN

# Fishing Reels

## QUADRUPLE

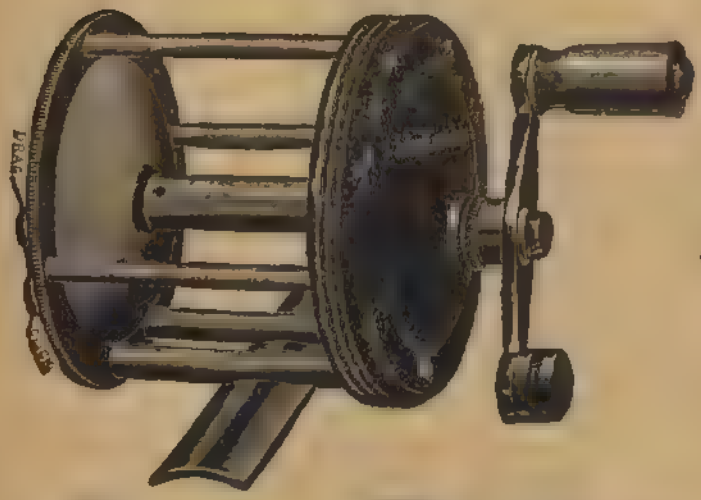


**No. 570**

Nickel-Plated

Steel Pivots, Long Spool, Inserted Hard Metal Bushing, Oil Cup over Bearings, Adjustable Click and Drag, Fancy White Handle

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 40 | 2 in. | $16.00 |
| 60 | 2¼ in. | 17 00 |
| 80 | 2½ in. | 18 00 |

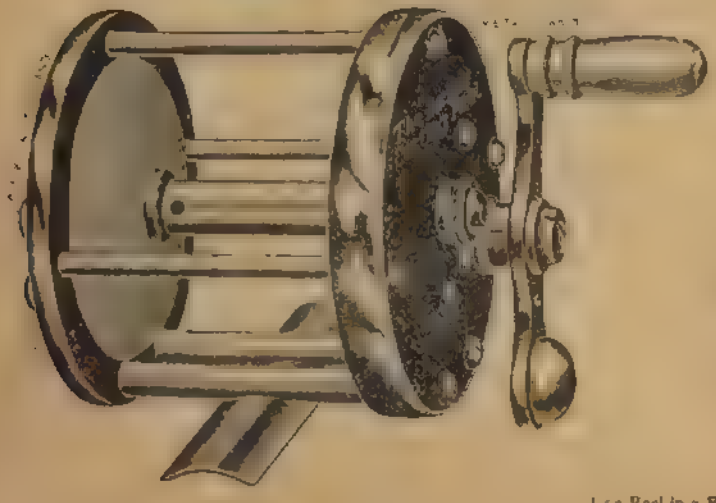


**No. 575**

Nickel-Plated

Steel Pivots and Pinion, Long Spool, Inserted Hard Metal Bushing, Oil Cup over Bearings, adjustable Click and Drag, Fancy White Handle.

| Yards | Diam. Disk | Per Doz |
|---|---|---|
| 40 | 2 in. | $24.00 |
| 60 | 2¼ in. | 27.00 |
| 80 | 2½ in. | 30.00 |



**No. 580**

Nickel-Plated
Rubber Plates

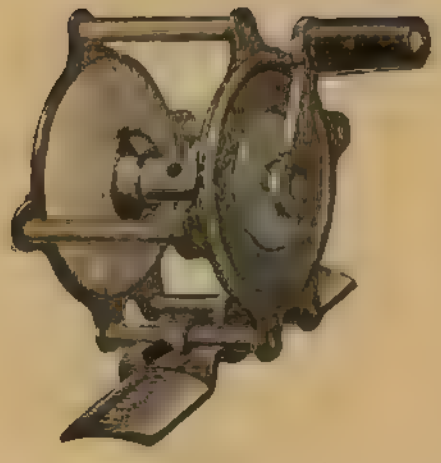
Steel Pivots and Pinion, Metal Bridge for Steel Cog Plate, Long Spool, Metal Saddle Bands on Edges, adjustable Click and Drag, Fancy White Handle.

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 60 | 2¼ in. | $36.00 |
| 80 | 2½ in. | 42 00 |

Each Reel in a Box

# Fishing Reels

## SINGLE ACTION

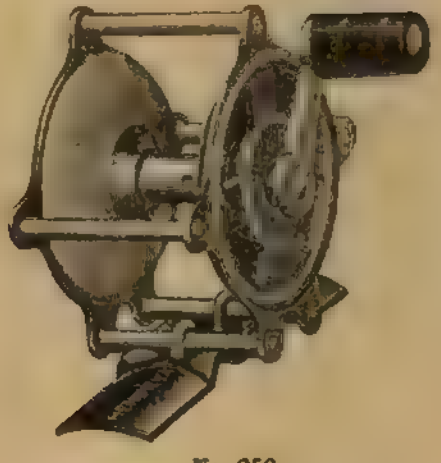


**No. 245**

Brass
Riveted Raised Pillar, with Click

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 25 | 1¾ in. | $ 2 50 |
| 40 | 2 in. | 2 75 |
| 60 | 2¼ in. | 3 25 |
| 80 | 2½ in. | 3 75 |

One Reel in a Box

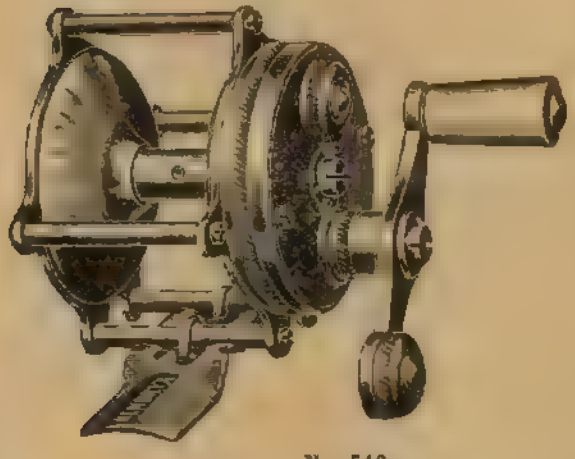


**No. 250**

Nickel-Plated
Riveted Raised Pillar, with Click

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 25 | 1¾ in. | $ 2 75 |
| 40 | 2 in. | 3 25 |
| 60 | 2¼ in. | 3 75 |
| 80 | 2½ in. | 4 25 |

## DOUBLE MULTIPLYING

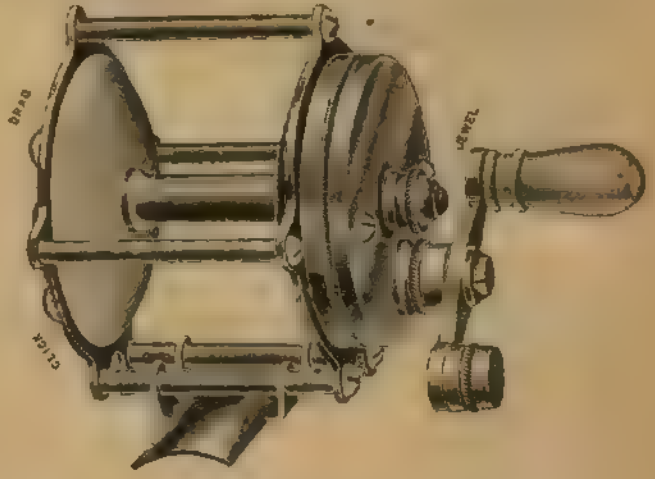


**No. 546**

Nickel Plated
Screwed Raised Pillar, Balanced White Handle, Adjustable Side Drag and Click.

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 40 | 2 in. | $ 9.60 |
| 60 | 2¼ in. | 10.80 |
| 80 | 2½ in. | 12.00 |
| 100 | 2¾ in. | 13 20 |
| 150 | 3 in. | 14.40 |

One Reel in a Box




**No. 555**

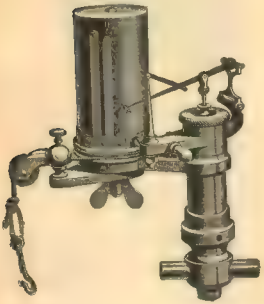
Nickel-Plated
Screwed Raised Pillar, Balance Handle, Adjustable Click and Drag, Fitted with **Two Jewels**, Finely Milled.

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 40 | 1¾ in. | $15.00 |
| 60 | 1¾ in. | 16.00 |

## IMPROVED THOMPSON INDICATOR

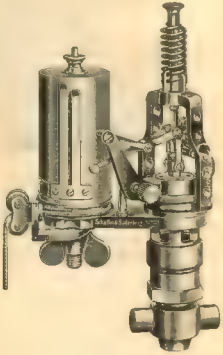
**Large and Small Pattern.**
**Adapted for all Speeds**

Fig. 142A



**With Outside Spring**
**1905 Pattern**

Fig 142B



The Improved Thompson Indicator, Standard Size, brass, nickel plated and highly finished, with two Straight or one Three-way Cock, one Spring and corresponding Scale, 100 Metallic Paper Cards, a Screw Driver and a bottle of Oil, all inclosed in finely polished oak box with plated trimmings ..... $ 5.00

Thompson Indicator, Small Size, and fixtures as above ..... 7.00

Extra Springs, (any scale) each ..... 5.00

Extra Boxwood Scales, each ..... .50

Extra Cards, one side Metallic, per 100 ..... 1.00

Three way Cocks, each ..... 10.00

The Improved Thompson Indicator (1905 Pattern) with outside spring, brass, nickel plated and highly finished, with two Straight or one Three-way Cock, one Spring and corresponding Scale, 100 Metallic Paper Cards, a Screw Driver, a bottle of Oil, a Cylinder Cleaner, a Spanner for hexagon on body of Indicator Tightening Pin for loose nut, and one bank of Indicator Cord, all inclosed in finely polished oak box with plated trimmings ..... $130.00

Extra Springs, (any scale) each ..... 5.00

Extra Boxwood Scale, each ..... .50

Extra Cards, one side Metallic, per 100 ..... 1.00

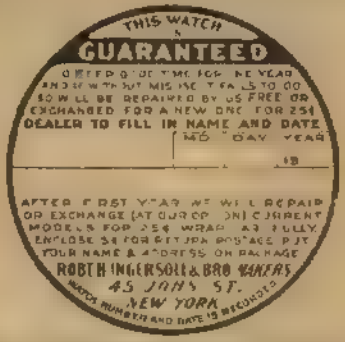
Three-way Cocks, each ..... 10.00

### List of Springs for Thompson Indicator (1905) Pattern

| Max. Pressure lbs. per Square inch | 3 | 8 | 12 | 20 | 30 | 40 | 60 | 75 | 90 | 110 | 120 | 130 | 150 | 165 | 200 | 250 | 300 | 360 | 400 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scale | 1/8 | 1/4 | 1/2 | 1 | 1 1/2 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 15 | 18 | 21 | 24 |

In ordering please state size of spring required.

# Ingersoll Watches



## YANKEE NEW MODEL

Stem wind and pendant set. SIZE 16. Case smaller and thinner than old model. Snap back milled center band. Roman or Arabic dials.

| | Per dozen |
|---|---|
| Nickel Finish | $12.00 |
| Gun Metal Finish | 12.00 |

One in a box, one dozen in a carton

## ECLIPSE NEW THIN MODEL

Stem Wind and pendant set. SOLID NICKLE CASE. Flush fitting snap back and bezel with heavy bevel crystal. Roman and Arabic dials.

| | Per dozen |
|---|---|
| Nickel Finish | $18.00 |
| Gun Metal Finish | 18.00 |

One in a box, one dozen in a carton

## Junior Thin Model

12 SIZE—THIN MODEL. Solid nickel case. Stem wind and pendant set. Cut steel pinions. Flush snap back and bezel with beveled crystal. Arabic and Roman figures. White dial

| | Per dozen |
|---|---|
| Nickel Finish | $24.00 |
| Gun Metal Finish | 24 00 |
| Gold Plate Finish | 24 00 |

One in blue satin [illegible]

## Midget

6 SIZE—LADIES' MIDGET. [illegible] Snap back and bezel with beveled crystal. White or Roman ring dial

| | Per dozen |
|---|---|
| Nickel Finish | $24 00 |
| Gun Metal Finish | 24 00 |
| Gold Plate Finish | 24.00 |

[illegible]

## Universal

[illegible] and Bezel [illegible]

| | Per dozen |
|---|---|
| Nickel Finish | $15.00 |
| Burnished Copper Finish | 15 00 |

JUNIOR THIN MODEL

MIDGET

UNIVERSAL

# New Haven Watches

## Solar

[illegible] 16 SIZE Snap back and bezel

| | Per dozen |
|---|---|
| Nickel Finish | $12 00 |
| Gun Metal Finish | 12 00 |

SOLAR

## Dixie

[illegible] can be removed from [illegible]

| | Per dozen |
|---|---|
| Nickel Finish | $15 00 |
| Gun Metal Finish | 15 00 |
| Copper Finish | 15.00 |
| Old Brass Finish | 15 00 |

DIXIE

# Kraemer Automatic Lighters

Very compact and may be used either as Cigar Lighter or Pocket Lamp. Fully Guaranteed

| No. | | Per Doz. |
|---|---|---|
| 100 | Nickel Plated | $12.00 |
| 300 | Silver Plated, Satin Finish | 18.00 |
| 350 | Elk Monogram, Silver Plated, Satin Finish | 24.00 |
| 500 | Gold Plated, Satin Finish | 30.00 |
| 550 | Elk Monogram, Gold Plated, Satin Finish | 36.00 |
| 600 | Red Leather Covered | 15.00 |
| 600 | Black Leather Covered | 15.00 |
| Extra Flints | | Per Gross 6.00 |

# Iver Johnson Revolvers

**AUTOMATIC AND HAMMERLESS**
**With Western Grip**
**.32 and .38 Calibres. All Lengths**

This is a one piece wood stock, without screw holes in side.

**Western Grip, Plain** — Add to price of regular Revolver . . . . .$ 2.00

**Western Grip, Checked**—Add to price of regular Revolver . . $ 2 50

**These Stocks not sold separately**

# Double Action Bull Dog Revolvers

**.22 Caliber, Rim Fire**

| | Each |
|---|---|
| 2½ in. Barrel, Nickel . . . . . | $3 00 |
| 2½ in. Barrel, Blue . . . . . | 3 50 |

**Center Fire**

| Calibers | Length | Finish | Each |
|---|---|---|---|
| .32 and .38 | 2½ in. | Nickel . . | $3.00 |
| .32 and .38 | 2½ in. | Blue . | 3.50 |
| .32 and .38 | 4½ in. | Nickel . | 3.50 |
| .32 and .38 | 4½ in. | Blue . . | 4 00 |
| .32 and .38 | 6 in. | Nickel . . | 4.00 |
| .32 and .38 | 6 in. | Blue . . | 4.50 |
| .44 | 2½ in. | Nickel . . . | 4.00 |
| .44 | 2½ in. | Blue . . . | 4.50 |
| .44 | 4½ in. | Nickel . . . | 4 50 |
| .44 | 4½ in. | Blue . . | 5 00 |
| .44 | 6 in. | Nickel . . | 5 00 |
| .44 | 6 in. | Blue . . | 5 50 |

For Parts See Pages 1832-1833

**DOUBLE ACTION BULL DOG REVOLVERS**

**With Perfect Grip and Loading Gate**

| Calibre | Length | Finish | Each |
|---|---|---|---|
| .38 | 4½ in. | Nickle . . . . . | $ 4 50 |
| .38 | 4½ in. | Blue . . . . | 4.75 |

# Hopkins & Allen Revolvers

SAFETY POLICE

**Double Action Hammer**

With Wood Police Grip

| Caliber | Length | Finish | Each |
|---|---|---|---|
| .38 | 4 inch | Nickel.. | $8 50 |
| .38 | 4 inch | Blue ... .. | 9.00 |
| .38 | 5 inch | Nickel | 9 00 |
| .38 | 5 inch | Blue . | 9 50 |

**Double Action Hammerless**

With Wood Police Grip

| Calibre | Length | Finish | Each |
|---|---|---|---|
| 38 | 4 inch | Nickel..... | . $ 9.00 |
| 38 | 4 inch | Blue ... | 9.50 |
| 38 | 5 inch | Nickel.. | .. 9.50 |
| 38 | 5 inch | Blue ... | . 10.09 |

# U. S. Revolver Co.

AUTOMATIC EJECTOR, HINGED FRAME

**Double Action Hammer**

| Calibres | Length Barrel in. | Finish | Each |
|---|---|---|---|
| .32 and .38 Cycle | 2 | Nickel ..... | .$ 5.50 |
| .32 and .38 Cycle | 2 | Blue ..... | 6.00 |
| .32 and .38 | 3 & 3¼ | Nickel ..... | 5.50 |
| .32 and .38 | 3 & 3¼ | Blue ..... | 6 00 |
| .32 and .38 | 5 | Nickel ..... | 6 50 |
| .32 and .38 | 5 | Blue ..... | 7.00 |

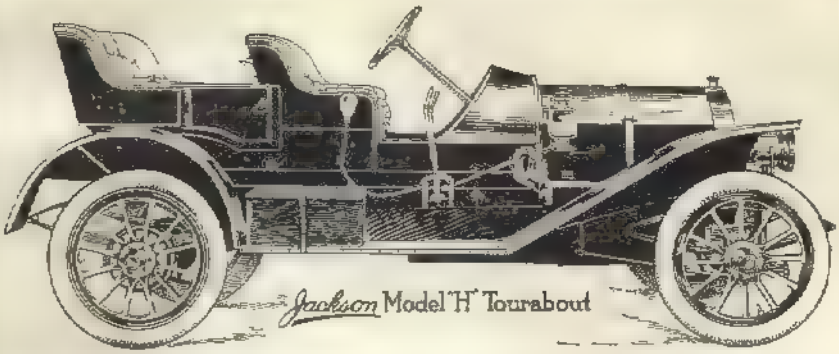
**U. S. Army Rubber Grips** fitted to all U. S. Revolvers add . . . . . 1 00

**Double Action Hammerless**

| Calibres | Length Barrel in. | Finish | Each |
|---|---|---|---|
| .32 Cycle | 2 | Nickel .. | $ 6 50 |
| .32 Cycle | 2 | Blue | 7 00 |
| .32 and .38 | 3 & 3¼ | Nickel | 6 50 |
| .32 and .38 | 3 & 3¼ | Blue | 7 00 |
| .32 and .38 | 5 | Nickel | 7 50 |
| .32 and .38 | 5 | Blue | 8 00 |

# JACKSON

## Model "H"—$1600




**4 Cylinder, 30 H. P., Bore, 4½"; Stroke, 4½"**

**Tires, 32 x 4. Gas Lamp, Magneto. Furnished with Touring or Tourabout Body**

**MODEL E—$2000.** Touring Car or Tourabout. 4 cylinder, 36-40 H. P., unit power plant, valves inclined in cylinder heads, overhead cam-shaft.

**MODEL C—$1250.** Touring Car. 2 cylinder, 20-24 H. P., chain drive.

**MODEL H—$950.** 4-passenger Touring Car. 2 cylinders under the hood, shaft drive, 15-18 H. P.

**MODEL F—$850.** Runabout. 2 cylinders under the hood, shaft drive, 15-18 H. P.

*WRITE FOR CATALOGUE*

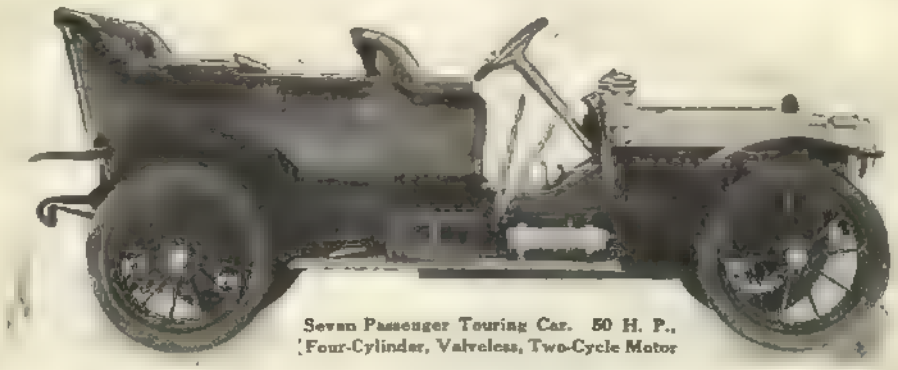
## JACKSON AUTOMOBILE CO.

JACKSON, MICH.

*Not An Assembled Car*

# The American Simplex

**Fifty Horse-power Valveless, Two-Cycle Motor runs with the smooth rhythm and applies power with the constancy of the Electric Motor**



Seven Passenger Touring Car. 50 H. P., Four-Cylinder, Valveless, Two-Cycle Motor

THE day is inevitable when the two-cycle gas engine will be the only type used in motor cars.

¶ We have recognized the virtues of the two-cycle principle—pioneers among manufacturers of high-grade, high-powered cars.

¶ Every manufacturer who puts into his car a six-cylinder engine admits the vital deficiency of the four-cycle principle—intermittent power—and his inability to overcome it.

¶ Multiplicity of cylinders merely approaches—never attains—constant turning power—the continuous torque you hear so much about.

¶ The American Simplex valveless two-cycle engine applies power with the constancy of the electric motor.

¶ There is not a valve, spring, roller, cam or camshaft on the American Simplex two-cycle engine. They would be superfluous. They hinder the four-cycle from generating its power in a steady, unceasing rush—yet the four-cycle engine cannot be built without them.

¶ The American Simplex is manufactured in our own plant in its entirety—motor, transmission, differential, gears, frame—every part where strength or harmonious action is vital to the long life of the car and the smoothness with which its motor runs.

¶ That is the reason the American Simplex is a motor car symphony—it has that complete harmonization of parts which no assembled car can have.

¶ Our 1908 literature tells of the flexible, three-point motor suspension; flexible radiator attachment; the rear axle transmission; the interlocking device on the gears; the improved torsion tube; the everlasting brake adjustment—every one a feature exclusive in the American Simplex—together with a comprehensive explanation of the differences between the American Simplex valveless, two-cycle motor and all four-cycle motors.

¶ Write for it.

## SIMPLEX MOTOR CAR COMPANY, Mishawaka, Ind.

Member A. M. C. M. A.

## MOURNING and HALF MOURNING FANS

With cord and tassel to match decoration

...norn, decorations, black ground, silver tip edge, assid. styles, black lacquered sticks, cord and tassel. 3 doz. in box.....Doz. 42c

L837—8 in., lustre parchment paper, silver and black ...ds, lavender, and white

L838—8 in., parchment paper, black and white grounds, silver spangled and fringed

...doz. ...rated carved black ...Ea. 2 styles, assid. 1 doz. in box.

...shaded white to gray ground floral and scroll decorations, frosted in black, white and ...

...edge, spangled, open work silk net, silver decorated carved white sticks, black cord and tassel. 4 doz. in box, assid. 3 styles.....Doz. 80c

L846—8¾ in., 3 sticks, assid. white and black grounds, silver and white floral decorations

...stone, carved black ...Ince and silver decorated sticks, black silk ...nd tassel. 1 doz. in box.....Doz. $1.50

L848—8¾ in., black mirror silk, silver spangled floral decorations, carved black lacquered sticks, black silk cord and tassel. 1 doz. in box.....

## JAPANESE SILK GEISHA FANS.

...ation silk paper, floral decorations, handsomely colored tassel and scroll designs, silver edge and tracing, decorated carved with

75c

...ge silk ...ancy assid. 1 doz. in ...Doz. 30c

...k, white silk gauze, floral

...g white and pastel shades, silver traced and spangled, carv-

...Doz. 3

L852—9 in., silk gauze, floral and silver spangled decorations, carved white silver decorated

$1.25

## FIRST QUALITY IMPORTED FEATHER FANS.

Staple sellers the year 'round. Very important. *When ordering please state color wanted.*

L892—Superior feathers, 8 color

...corated in hand painted floral design, white sticks. ¼ doz. in box

Doz. $2.25

L846—10½ in., superior feathers, colored edges, extra strong, decorated, tinted sticks to match fan, 2 white, 2 pink, 1 blue, assid. 5 doz. in box.Doz. $4.25

## JAPANESE NOVELTY FANS.

A SPLENDID VALUE.

...11½, narrow folding, floral and scenic

30c

L857—12 in., American flag design in national colors one side, Japanese scenic and floral the other, black lacquered sticks. 1 doz. in box...Doz. 42c

...folding, 3 colors ...tinted floral d

L856—8½ in., narrow folding, floral and scenic decoration colored d

...3 ting top and bottom, entirely new, assid. colorings, carved brown lacquered sticks, cord and tassel. 1 doz. in box.....Doz. 84c

...in. 84

...led but ...ol, deep ...ta ...rosaic ian shape, silver ornamented black lacquered sticks, assid. tints, cord and tassel. 1 doz in box.....Doz. 89c

## JAPANESE SILK FANS.

...edge, silk covered hand painted Jap-

...handle, wit

...in box Doz. 35c

## SPECIAL GEISHA FAN

L862 Silk covered, assid. colored floral decorations, silver bound edge black enamel stick, cord and tassel, 6x21. 1 doz. in box

For dozen, 45c

L863—*Don't fail to stock this one.* 9½x19¾, good quality silk, hand painted floral landscape and figure decorations, some silver tracing, silver bound edge, black lacquered handle, cord and tassel. 6 shapes and decorations. 2 doz. in box, assid.

...scape ...tion ...tints, embossed ...k handles, cord and tassel. 1 doz. in box. 6 styles, assid. Doz. 65c

silver tracing, black or white handles.

L865 8½x14, silk covered red and blue hand ...ndred color type decorations of Jap-

...k white silk, ...hand painted floral and bird ...mammal colors, black lacquered ...handle silk tassel and cord. 6 ...assid. 1 doz. in

L867—8 x 14, white ...ge silk ...verse, hand painted land ...sock with two Japanese figures with padlacquer handle ...ded silk kimonos, fine black silk tassel and cord. 1 doz box assid. Do. $1.25

# JAPANESE BASKETS.

A complete line of staple sellers, priced right.

## JAP FANCY CANDY BASKETS.

L1929 3½ x ...linko, double fancy woven split white bamboo. 100 pcs in box (Gro. lots, $3.85). Doz. 30c

...lation fixed ...ers and cover. 1 doz. in box. Two ...

L3602—3x4¾, covered stocks bamboo frame finely woven in white with variegated braid straw band center. 1 doz. in box, assid

L27—Assid. styles, colors, sizes, split bamboo and blanket. Average 13 in.

L7035—Handled candy basket. A shapes and colors, split bamboo

## MINOKI TRINKET AND NOVELTY BASKET ASST.

...sted shapes, heart, ...ch, 2-piece ...woven sides, blank ...covers, gold and silver trimmings, with catch, average 6½ in. 1 doz in box. Assid

## JAPANESE WORK BASKETS

...6—*Will retail at 15 and 20 cents each,* of 4 mats, 3 pieces in nest, beautiful ...morwoven rattan, braid and splint, ...dium 7 to 10 in. Per dozen 95c

## JAP COVERED WORK BASKET

L5330—8½x2¾ to 6¾x3¾ round

...ed, ...hinged ...cover, loop fastener, assid. doz

## MISCELLANEOUS JAP BASKETS

L5844—Donuts ...d fine split bamboo ...propriate for fruits and as ornament. 2¾ to nest, 2½ to 11 in. diam.

Nest of 24, 89c

L5345, Handled Fruit Basket—Round 3 ...25 to 9x7½ fine round stock, wax fruits assid. green and maroon. 5 to nest.

Nest of 5, 35c

## COUNTER OR SEWING BASKET.

...in brown and green ...colors. 10 to a nest graduated 7 to 11

## JAPANESE FANCY SHOPPING BASKET.

L1810 – Variegated bright color woven straw braid, waved ...double handles, outside ...ket, 3 in nest.

Doz. pcs 48c

## JAPANESE LUNCH AND MARKET BASKETS.

L704—2-in nest, large ...ize ...ket ...ges in

## FISHING BASKET

*One of our best values in our line of good ones*

L2619, ...9x12x5, 11x14x8 ...arrow split ...ral color, riveted frame, ...p fastener, hinged lid

Per nest of 3, $1.35

...worm split bamboo riveted frame, double folding cover with hinge hangles and clasp fast-

## JAPANESE LETTER OR COUNTER BASKET.

3 in nest, 13¾ and 9½x ...s of 3, 45c

## JAPANESE BAMBOO HAMPER

...Heavy natural wood split bamboo ...ripped frame, sides ...handles, handled cover, inside 15¾x13¾x19. 2 in nest.

Nest of 2, $1.40

## JAPANESE WASTE PAPER BASKETS.

L1920 Closely braided of plain and colored split bamboo, 8 in nest. 6x13 to 11x24 in.

Nest of 5, 90c

L1922—Closely braided of split bamboo, natural finish, 3 colored stripes, 6 in nest, 7½ to 13 in. diam., 14 in. high ... Nest of 5, 90c

L5335—Fancy woven split bamboo, double thickness. 2 fancy colored ... handle top ...ortable 10x16¾.

## BIG VALUE.

*A popular and practicable seller.*

L1923 – Plain and colored split bamboo, 12 sizes to nest, woven ...sure 12x21¾.

Nest of 10 65c

## SPLINT BAMBOO SPLASH MAT

...decorations. 1 doz in pkg.

Doz. 84c

## SLEEVE PROTECTOR.

L132—Japanese straw ...cuffs. Assid. sizes, ...firm weave.

Doz. pr.

## MOURNING and HALF MOURNING FANS

With cord and tassel to match decoration

...norn, decorations, black ground, silver tip edge, assid. styles, black lacquered sticks, cord and tassel. 3 doz. in box.....Doz. 42c

L837—8 in., lustre parchment paper, silver and black ...ds, lavender, and white

L838—8 in., parchment paper, black and white grounds, silver spangled and fringed

...doz. ...rated carved black ...Ea. 2 styles, assid. 1 doz. in box.

...shaded white to gray ground floral and scroll decorations, frosted in black, white and ...

...edge, spangled, open work silk net, silver decorated carved white sticks, black cord and tassel. 4 doz. in box, assid. 3 styles.....Doz. 80c

L846—8¾ in., 3 sticks, assid. white and black grounds, silver and white floral decorations

...stone, carved black ...Ince and silver decorated sticks, black silk ...nd tassel. 1 doz. in box.....Doz. $1.50

L848—8¾ in., black mirror silk, silver spangled floral decorations, carved black lacquered sticks, black silk cord and tassel. 1 doz. in box.....

## JAPANESE SILK GEISHA FANS.

...ation silk paper, floral decorations, handsomely colored tassel and scroll designs, silver edge and tracing, decorated carved with

75c

...ge silk ...ancy assid. 1 doz. in ...Doz. 30c

...k, white silk gauze, floral

...g white and pastel shades, silver traced and spangled, carv-

...Doz. 3

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Nest of 10, 65c

## SPLINT BAMBOO SPLASH MAT

...decorations. 1 doz. in pkg.

Doz. 84c

## SLEEVE PROTECTOR.

L132—Japanese straw ...cuffs. Assid. sizes, ...firm weave.

Doz. pr.

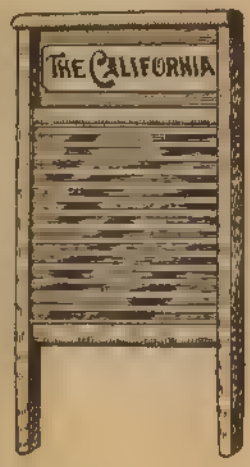
# Washboards

### JEWEL

No. | Per Doz.
797–Pail Size, Single Zinc Surface, Globe Crimp ...$ 3.00
897–Medium Size, Single Zinc Surface, Globe Crimp..... 3.50
Weight, per Doz., 16 pounds

### OUR MISSES

### THE CALIFORNIAN




No. | Per Doz.
130–Single Zinc Surface, New Crimp.....$ 4.00
Weight, per Doz., 39 pounds

### LEADER

No. | Per Doz.
785–Single Zinc Surface, Globe Crimp, Protector Top....$ 4.50
Weight, per Doz., 26 pounds

### MORNING STAR

No. | Per Doz.
761–Single Zinc Surface, Protector Top, Hardwood Frame.....$ 6.00
Weight, per Doz., 34 pounds

### SOAP SAVER

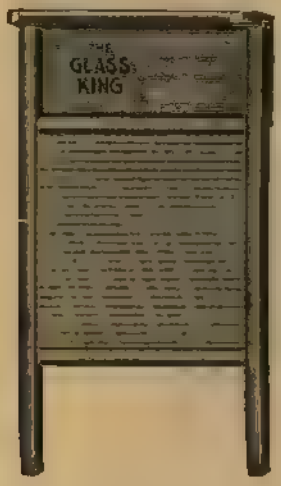
No. | Per Doz.
722–Single Zinc Surface, Ventilated, Globe Crimp, Galvanized Iron Protector Top.$ 6.50
Weight, per Doz. 40 pounds

# Washboards

### BRASS KING

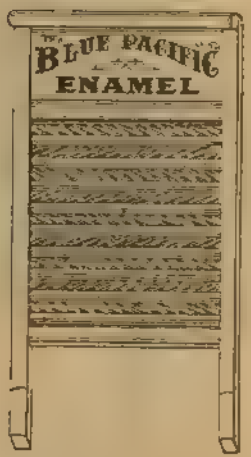
No. Per Doz.
800–Single. Brass Surface, Spiral Crimp, will not Corrode, Crack or get out of shape..... ..$ 8.00
Weight Per Doz. 30 Pounds

### GLASS KING




No. Per Doz.
860–Single, Glass Rubbing Surface, Plain Crimp, will stand Hottest and Coldest Water.....$ 8.50
Weight Per Doz. 38 Pounds

### BLUE ENAMEL




No. Per Doz.
870–Single, Enamel Surface, Fancy Crimp, Enamel will not Chip or Crack.....$ 8.50
Weight Per Doz 39 Pounds

### MORNING STAR

No. Per Doz.
94–Single Zinc Surface, Medium Plain Crimp....$ 4.00
Weight, per Doz., 30 pounds

# JONES ELECTRIC HORN

**The new Jones Electric Horn is FAR SUPERIOR to any other power-operated horn. It is a revelation to all who see or hear it. Possesses many distinctive features not found in any other automobile signal—made by Jones—a guarantee of superior workmanship, design and material.**

## THE JONES HORN EXCELS FOR THESE REASONS:

Instant beginning and cessation of sound. Remarkably low current consumption (operates on 6 volt Storage Battery or 5 Dry Cells). Pleasing to the ear. Can be heard for a great distance. Simple in construction. Can't get out of order. Easily attached. Complete wiring to accommodate any car furnished with push button attached. Made in 3 different Models.

Model L Horn

With 12-inch bell and complete attachment, $25.00

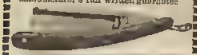
Model O Horn

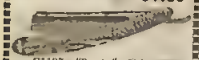
With curved bell and complete attachment, $35.00

**JONES SPEEDOMETER DEP'T**
**UNITED MANUFACTURERS INC.**
Broadway & 76th St., - NEW YORK

## J. R. TORREY RAZOR CO. WELL KNOWN ENGLISH STEEL RAZORS.

The razor with a reputation. Honorably known to the trade for the past 20 years. Ground now being stimulated by liberal advertising. We recommend that you carry a small stock in order to get your share of the trade. Each razor has manufacturer's full written guarantee.





G1137 "Beauty" ⅝ in. rounded point, full concave, extra polish all over the dot tang, perfect edge, new design fancy celluloid handle. 1 in case. (Retail price, $3.50 ea.) ½ doz. lots, $15.00 d. **$1.65**

**$1.75**

½ doz. in glass top metal frame display case, silk lined. Complete, **$4.75**

## KARL ENGEL & SONS, WALD, GERMANY. CELEBRATED KROMPINZ RAZORS.

Famous German barbers' razors. Highest award, International Exhibition. Parts and

G18—⅝ in. half concave, square points. Blue cut, stamp polished and etched, Marble rubber handle, white line. 1 in case, ½ doz. in box. $4.00

G14 [illegible] lots, $8.00 doz.) ....Each, 72c

G16 [illegible] Each 79c

G18 [illegible] Each 87c

G21 [illegible] $1.25

## RAZOR ASSORTMENT

Cabinet box. Complete, Out

## WORLD FAMOUS WADE & BUTCHER RAZORS

G1100—⅝ in. square point, etched with scroll and lettering. $3.75

G1115—⅝ in. square points, scroll etching, hollow ground, black rubber handle. Doz. $4.50

G1120—⅝ in. square point, hollow ground, tang etched with trade mark, double dot. 1 in case, ½ doz. Each, 78c

G1130—⅝ in. round point, ⅝ hollow ground, [illegible] der, blue. Each, 78c

G1110—⅝ in. square point, ⅝ hollow ground, [illegible] per cut, black rubber handle. ½ doz. Each, 76c

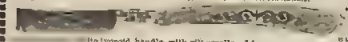
ble shoulder, file cut tang, black rubber handle with silk scroll and lettering. lots, $3.25 doz.) ..... Each, 72c

handle. 1 in case. (½ doz. lots, $3.50 doz.).

h in sealed case. ½ doz. lots, $3.50 doz.) Each, 76c

## AN ALWAYS POPULAR NUMBER.

Hollow ground, right weight, black, white xylroid handle.



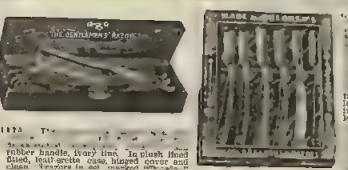
Xylroid handle, with silk scrolls. 1 in case. (6 doz. lots $10.75 doz.) Each, **92c**

mond point, etched, full hollow, double [illegible] $1 05

[illegible] $1 50

[illegible] $1 74

$30.00 doz.) Each, $1.80





fancy celluloid handles, in new style lettered disc [illegible] $5 75

rubber handle, ivory tips, in plush lined fluted, leatherette case, hinged cover and chain. Ferrules in all [illegible] $3 95

## BOKERS' TREE BRAND RAZOR.

[illegible] 95c

## 50 CENT IMPORTED RAZORS.

Guaranteed to shave. Don't compare with the cheap trashy goods.

re point, hollow ground, corru- [illegible] $1 25

G23—⅝ in. square point, polished tang, hollow ground, fancy colored celluloid handle. Each in case, ½ doz. in box. $4.00

## THE FAMOUS "RAZORINE."

The Successful Sharpener.

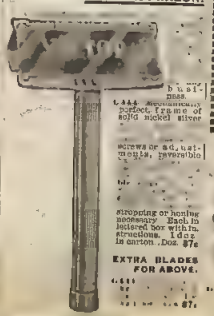
*The original and best. Known everywhere. Fully guaranteed.*

RAZORINE | G1— Advertised and sold all over

15 [illegible] proved by its use. Each piece in tin [illegible] case, on display [illegible] ceived 1 card in

**$1.00**

## THE "VICTOR DOUBLE EDGE 10c SAFETY RAZOR.



[illegible] b [illegible] mas. [illegible] perfect frame of solid nickel silver [illegible] screws or set, [illegible] mounts, reversible [illegible] stropping or honing necessary. Each in [illegible] box with instructions. 4 doz. in carton. Doz. 87c

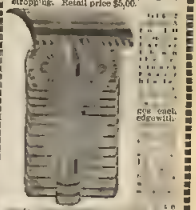
EXTRA BLADES FOR ABOVE.

[illegible] e spring steel, for safe and [illegible] adjustment of thin double edged [illegible] Stropped like razor as an ordinary [illegible] In box [illegible] Doz. $4 00

## THE WORLD FAMOUS GILLETTE SAFETY RAZOR.

*Has has the most remarkable sale ever known in razors. Advertised extensively, making selling easy. You will make an extra profit if you fail to handle the quick selling "Gillette."*

Shaving made easy—no honing—no stropping. Retail price $5.00.



[illegible] cut edge with [illegible]

Complete, **$3.75**

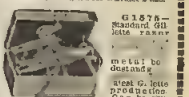
We will fill these at the lowest printed price which is the same as that of imported razors.

G1421, "New Process" Blades. For above razor. 1 doz. in box. Per box, **75c**

Free Display Signs—With every order for ½ doz. razors we give a complete set of display signs free of charge.

### Gillette Safety Razor In Sanitary Metal Case.

Especially designed for traveler's use.



G1878—Standard Gillette razor [illegible] metal; be [illegible] dustandg [illegible] Best G. lette proposition [illegible] Can be carried in the pocket. In extreme right [illegible] ar where [illegible] shown. Each, **$3.75**

### Gillette's "Pocket Edition" Safety Razor.

Gold

G3G1—Triple silver plated frame, [illegible] w style, fancy basket pattern handle, 12 blades, flat silver plated metal pocket case, pattern to match handle, velvet finish. Each in box. Retail price $5.00 Each, **$3.75**

G3G2—An [illegible] good, gun gold plated razor. Retail price $5.50. Each, **$4.15**

G3G3—As G3G1, full gold plated case and razor. Retail price $6.00 Each, **$4.50**

### "Gillette" Safety Razor Outfit.

[illegible] large stock of Williams' best shaving soap. Each in a silver plated holder. Set complete in velvet lined [illegible] **$5.00**

## SAFETY BLADE STROPPER.

# Standard Makes of GUNS AND REVOLVERS

We can save you money on guns. Buying in large quantities, we are enabled to quote prices impossible to the small jobber. While our stock is not the biggest in the trade, it is all good. We solicit your business in this line on the basis of first grade goods at honest prices.

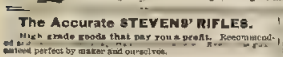
Note in particular our strong showing of the famous Stevens' Guns.

## The Accurate STEVENS' RIFLES.

High grade goods that pay you a profit. Recommended as [illegible] Every gun tested perfect by maker and ourselves.

### STEVENS' "LITTLE SCOUT" RIFLE.

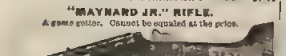
Absolutely the best low priced rifle to be had.



H14—Will shoot any 22 cal. cartridge. Very simple, all parts [illegible] is extracted, positive horizontal extractor, 18 in. barrel, rear and gerdan silver knife edge front sights, [illegible] ..... Each $1.45

### "MAYNARD JR." RIFLE.

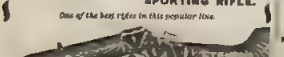
A game getter. Cannot be equaled at the price.



K18—Stevens "Maynard Jr." lever action full [illegible] machine made interchangeable parts, 18 in. half octagon barrel, accurately rifled, positive extractor, shoots 22 short and long cartridges. Each $1.90

### STEVENS' "CRACKSHOT" SPORTING RIFLE.

*One of the best rifles in this popular line.*



K16—Shoots "BB," 22 short, 22 long and 22 long rifle cartridges, 20 in. barrel. Too well known to need further description. 4 lbs. 1 in pasteboard box. Each **$2.40**

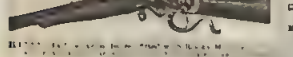
### STEVENS' "LITTLE KRAG" RIFLE.

With military straight pull action—very popular.

K41 30 in round barrel, blued steel frame, walnut stock and forearm, rubber butt plate, bead front and open rear sights, well known Mauser action bolt. 8¼ lbs..... Each. $9.00

### STEVENS' "FAVORITE" SPORTING RIFLES.

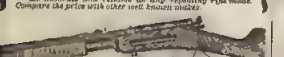
Everything the name implies for all kinds of shooting.



K17[illegible] ..... $4.00
long rifle. 4½ lbs
K1732—As K1723 [illegible] ..... $4.00

### STEVENS' "TAKE DOWN" REPEATING RIFLE.

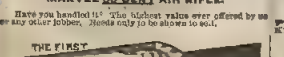
*As accurate and reliable as any repeating rifle made. Compare the price with other well known makes.*



K30—Shoots any 22 cal. cartridges, 24 in. round barrel fitted with bead front, and sporting rear sights. Rubber butt plate, will carry 15 cartridges. Gun can be dismantled by turn of screw, so can be packed in trunk. 6¼ lbs. Each, **$7.50**

### MARVEL 50 CENT AIR RIFLE.

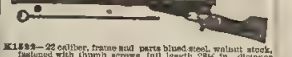
Have you handled it? The slickest value ever offered by us or any other jobber. Needs only to be shown to sell.



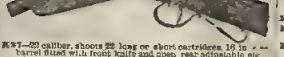

K190—Single shot, modeled after the up to date target rifles, all metal parts full nickel plated and polished, strong powerful spring, all parts interchangeable, carries as far and has as good a penetration as any air rifle on the market. Nicely lacquered and finished hardwood stock. Guaranteed perfect in workmanship and material and to give the utmost satisfaction. 1 doz. in wood case..... Doz. **$3.75**

## The Reliable HAMILTON RIFLES.

Low in price but accurate in shooting. Each rifle is guaranteed perfect [illegible] and tested before [illegible] or fine [illegible] or long [illegible]



K1822—22 caliber, frame and parts blued steel, walnut stock, fashioned with thumb screws, full length 28½ in., distance between sights 16 in., adjustable peep sight for 25 short or long rim fire cartridges..... Each, **$1.10**



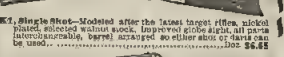
K37—22 caliber, shoots 22 long or short cartridges, 16 in [illegible] barrel fitted with front knife and open rear adjustable sights, all parts steel blue black finish..... Each, **$1.10**

K1[illegible] New Model Take Down Sporting Rifle [illegible] ..... $1.25

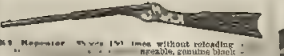
## 1909 CELEBRATED "KING" AIR RIFLES.

[illegible] ..... Each $0.95
[illegible] ..... Each $1.45

### "TAKE DOWN" KING AIR RIFLES.

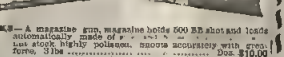


K1, Single Shot—Modeled after the latest target rifles, nickel plated, selected walnut stock, improved globe sight, all parts interchangeable, barrel arranged so either shot or darts can be used..... Doz. **$6.65**



K9 Repeater [illegible] ..... Each [illegible] repeatable, genuine blued [illegible] ..... Doz. $8.95

### 500 SHOT "KING" AIR RIFLE.



K8—A magazine gun, magazine holds 500 BB shot and loads automatically, stock and frame of [illegible] cast stock highly polished, shoots accurately with great force. 3 lbs..... Doz. **$10.00**

### "ONE THOUSAND" SHOT "KING" AIR RIFLE.

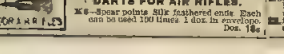
K6—Magazine gun, lever action holds 1000 "B. B." shot, loads automatically, steel and brass working parts, highly polished black walnut stock, shoots accurately and with great force. Length 36 in., 3 lbs. ..... Doz. **$13.20**

### "KING" CORK TARGET AIR RIFLE.

K5—A practical twilight target air rifle, shoots corks giving a loud report, sensitive and well made, modeled and operated after the same manner as the single air rifle, entire gun full nickel plated, length 18 in. 1 lb. 10 oz..... Doz. **$2.00**

### BENJAMIN AIR RIFLE.

Sends an air rifle shot through ¼ inch white pine easily. A practical gun for hunting small game, unsurpassed as a target rifle.



K1875—Operated by compressed air, charged by pulling out pump rod as far as it will go, then pressing it in, which shoot 3 lbs. take down [illegible] and detached barrels [illegible] of pump and air chamber, [illegible] ..... Each, $4.50
[illegible] an accurate shooting gun. Shoots regular air rifle shot. Full directions with each. 1 in box. Each. **$1.95**

### B B SHOT FOR AIR RIFLES.

[illegible] ..... Per Bag, $2c 25 lb bag Bag, **$2.20**



### DARTS FOR AIR RIFLES.

K6—Spear points Silk fashioned ends. Each can be used 100 times. 1 doz. in envelope. Doz. 10c,

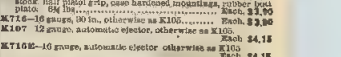
## "COMPETITION" SINGLE BARREL SHOT GUN.

K419—12 gauge, 30 and 32 in. blued steel barrels, checkered full pistol grip, rubber capped, best American walnut stock, rubber butt plate, all parts drop forged steel. 7¼ lbs. Each, **$3.75**

## STEVENS' SINGLE BARREL SHOT GUNS.

K105—12 gauge, 30 and 32 in. closure steel barrels, top snap low rebounding hammer, choke bored, varnished walnut stock half pistol grip, case hardened mountings, rubber butt plate. 6¾ lbs..... Each, **$3.50**
K716—16 gauge, 30 in., otherwise as K105..... Each, **$3.90**
K107 12 gauge, automatic ejector, otherwise as K105.
Each **$4.15**
K716E—16 gauge, automatic ejector otherwise as K105
Each **$4.15**

## STEVENS' DOUBLE HAMMER GUNS.

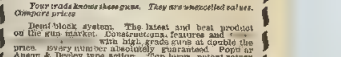


K226—12 gauge, 30 and 32 in. special smokeless steel barrel, choke bored for nitro powder, real ejector extension rib, 6 bolts, cannot shoot loose, top snap, low circular hammers, rebounding bar locks, checkered pistol grip, walnut stock, checkered fore end, case hardened mountings. 7¾ to 8¼ lbs..... Each **$9.75**
K226 [illegible] in. barrel, otherwise as K226. Each **$9.75**

## STEVENS' NEW HAMMERLESS GUN.

*Your trade knows these guns. They are unexcelled values. Compare prices*

Bend block system. The latest and best product of the gun makers' [illegible] features and construction with high grade guns at double the price. Every number absolutely guaranteed. Proof at Anson & Deeley type action. Top lever, patent rotary compounding bolt through extension rib, check hook, rebounding locks, automatic safety, extra long frame. Barrels compressed forged steel, drop forged base, regular length of stock 13 in., with drop from 2¾ to 2¾ in. Each gun perfectly balanced.



K325—12 gauge, 30 and 32 in., smokeless steel barrel, extra heavy breech, top snap, matted extension rib with top bolt, impossible to shoot loose, automatic safety, extra long frame, all parts drop forged steel, fine American walnut stock, checkered pistol grip and fore end rubber butt plate, right bored, modified choke or left bored both barrels. Will stand extra heavy load of either black or smokeless powder. 7¼ to 7¾ lbs. Each, **$13.50**
K3226—16 gauge, 30 in. barrel, otherwise as K325 Each, **$13.50**

[illegible] rib. Drop [illegible] barrels, checkered pistol grip and fore end, rubber butt plate. Each, **$17.75**
K356—16 gauge, 30 in. barrel, otherwise as K3[illegible] Each, **$17.75**
K365—12 gauge, 30 and 32 in. Krupp fluid steel barrels, choke bored for nitro powder, matted extension rib, drop forged case hardened frame, varnished walnut stock hand rubbed, full pistol grip, finely checkered and capped, hand checkered pistol grip and fore end, rubber butt plate. 7¼ to 8¼ lbs. Each **$23.00**
M366—16 gauge, 30 in., otherwise as K365. Each **$23.00**
K376—12 gauge, 30 and 32 in. Krupp blued steel barrels, choke bored for nitro powder, matted extension rib, *handsomely engraved case hardened frame, in sporting designs*, finest selected English walnut stock, hand checkered pistol grip and fore end, finest rubber butt plate, checkered, rubber butt plate. 7¾ to 8¼ lbs. Each, **$28.50**
K376 [illegible] 16 gauge, 30 in., otherwise as K375 Each **$28.50**

## NEW STEVENS' REPEATING SHOT GUN.

The 1909 shot gun De Luxe.

K532—12 gauge, 30 in. bbl., repeating, 6 shot. Browning patent. Smokeless, barrel of compressed forged steel, carbon finish, receiver solid drop frame, all working parts [illegible] in 3 seconds. Safety inside the guard, gun can be fired as fast as shooter can work the slide handle..... Each. **$18.00**

### "ITHACA" HAMMERLESS DOUBLE BARREL SHOT GUNS.

Shooting qualities fully warranted. Bolt fastenings never to shoot loose with black or nitro powder. Automatic and independent safe. Manufacturer guarantees every gun perfect and will replace any defective part within one year from date of purchase.

[illegible] gauge, fine quality [illegible] steel barrels, [illegible] bored [illegible]

[illegible] $78.50

Note. We can supply any Ithaca gun not listed, shipped [illegible] factory (no extra charge for building to order). Complete gun catalogue and quotations [illegible] application.

### THE "UNION" 6 SHOT MAGAZINE GUNS.

10 and 32in nitro blued steel barrels, modified [illegible] long drop solid breech block double [illegible] action, telescope sighting rib, [illegible] cutter trigger to cock and uncock, with [illegible] barrels can be locked through bolt [illegible] own, black walnut checkered stock, oil [illegible] ed for nitro powder, all parts full [illegible] .....each $13.25

### L. C. SMITH CO'S DOUBLE HAMMERLESS GUN.

[illegible] pattern, Damascus [illegible] bbls, choke bored [illegible] $41.40

### CLEANING RODS

22 caliber rifles, twisted [illegible] cad. 1.doz in bd [illegible] cleaning rod, 32 caliber, brass [illegible] copper bronzed rod With slotted end... 1 doz. in bd Doz. 27c

### IVER JOHNSON'S HAMMER THE HAMMER REVOLVERS

We guarantee every number and will replace broken parts free of charge.

Standard pattern double action gun barrel, [illegible] placed, rubber handles

K3001—32 cal., rim fire, 7 shot, 3in [illegible] Each $2.00

K3013—32 " blued, 3½ " 3 [illegible] 17 " 4¼ [illegible] $2.00

Automatic Double Action Hammerless—3¼ inch barrel, otherwise as above. All 5 shot, rubber handles [illegible] ca., nickel, [illegible] " 17 " 3¼ [illegible] K3013—32 " blued, 3½ " 3 [illegible] 17 " 4¼ [illegible] $4.50

Auto matic Double Action Hammerless—above, only with 4 in barrel. [illegible] blued, 18 oz. ... Each $4.00

Each $2.00

Automatic [illegible]

[illegible] cal. Ham [illegible] ers, nickel [illegible] density ris [illegible]

One of the best and quickest firing revolvers [illegible] hammer; automatic shell ejector, EXTRA LONG checkered and engraved rubber grip, fills the hand and gives steady aim. The new revolver for police, night watchmen, target shooting and self protection. 3015—32 [illegible] nickel [illegible]

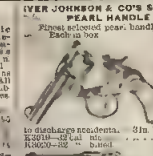
[illegible] as all improvements, patent safety rig [illegible] impossible to discharge accidentally, re [illegible] patent improved automatic, raising sid [illegible] gun [illegible] on high grade revolvers. 3¼ [illegible] $4.25 [illegible] 4.25

### STEVENS GUN GREASE

K16—For cleaning and protecting fire arms and all bright metals. 4oz. [illegible] ing and preserves finish of [illegible] bbls to rust [illegible] Pt.

### IVER JOHNSON & CO'S SPECIAL PEARL HANDLE REVOLVERS.

Finest selected pear. handles, carefully f [illegible] Each in box



Automatic Double [illegible] With all improvements and patent [illegible] position this [illegible] 3in. barrel, 5 shot. K2016—32 Cal. nickel, [illegible] K3020—32 " blued [illegible] Automatic [illegible] to discharge accidents. [illegible] Each $4.50

K3043—32 cal., blued

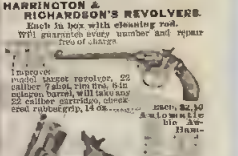
### COMBINATION REVOLVER. 22 Caliber.

K3080—Rubber handle, round bar- [illegible] long cartridge and 22 blanks, 7 oz. Each. 82c

### HARRINGTON & RICHARDSON'S REVOLVERS.

Each in box with cleaning rod.

Will guarantee every number and repair free of charge.



Improved model target revolver, 22 caliber 7 shot, rim fire, 6in octagon barrel, will take any 22 caliber cartridge, sheet steel rubber grip, 14 oz. [illegible] each, $2.50

Automatic Ejecting Hammerless

[illegible] terial used throughout, 32 caliber, 7 shot, rim fire, [illegible] chamber, cal., nickel, 3 shot, 18 oz. Each, $4.00 [illegible] " " 18 " " 4.00 [illegible] ned, " " 18 " " 4.00

K3030, H. & R. Semi-Hammerless Police Premier — Patent safety trigger, impossible to [illegible]

[illegible] $4.00 [illegible] 4.25

### WELL KNOWN R. H. A. CO'S LOADED SHOT GUN SHELLS AND METALLIC CARTRIDGES.

Once Used the Sportsman Will Have No Other.

Quality strictly guaranteed by BUTLER BROTHERS and the MAKERS.

[illegible] as been fully [illegible] live market. All [illegible]

### INDIAN" BLACK POWDER LOADED SHELLS.

[illegible] rove it to be as any black powder on the market. Primed [illegible]

12 GAUGE—65 in carton, 500 in case, wt of case approximately 60 lbs

| | Wt. of Box | Wt. of Case of 10 Boxes | Per Box | Per M |
|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | $1.40 $13.75 |
| [illegible] | [illegible] | [illegible] | [illegible] | 1.50 14.75 |
| K3266—3¼ | 3¼ | [illegible] | [illegible] | [illegible] |
| K3314—3½ | 3½ | [illegible] | [illegible] | [illegible] |

[illegible] approximately 60 lbs.

| | | | | |
|---|---|---|---|---|
| K3154 | 4 dr. | 14oz. | No. [illegible] | [illegible] |
| K3050 | 4 | 14 | " [illegible] | [illegible] |
| K3053 | 4 | 14 | " [illegible] | [illegible] |

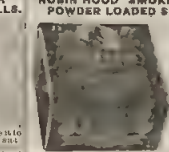
16 GAUGE—25 in carton, 500 in case, wt. of case approximately 60 lbs

| | | | | |
|---|---|---|---|---|
| K3064 | 2¾ dr. | 9¾ oz. | No. 6 | [illegible] |
| K3066 | 2¾ | 9¾ | " 4 | 1.45 14.00 |
| K3069 | 2¾ | 9¾ | " [illegible] | [illegible] |

20 GAUGE—25 in carton, 500 in case, wt. of case approximately 60 lbs.

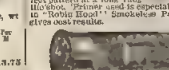
| | | | | |
|---|---|---|---|---|
| K3076 | 2¾ dr. | 9 oz. | No. 6 | 1.42 14.00 |
| K3078 | 2¾ | 9 | " 4 | [illegible] |

### "ROBIN HOOD" SMOKELESS POWDER LOADED SHELLS.



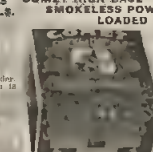
Powder which is [illegible] powder or injure the [illegible] smokeless powder [illegible] lower it

[illegible] this is safe for bl [illegible] fast pattern at a long rang [illegible] shot. Primer used is especially adapte [illegible] "Robin Hood" Smokeless Powder and gives best results.



| | | | | |
|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | $1.20 $17.75 |
| [illegible] | [illegible] | [illegible] | [illegible] | 1.30 20.00 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

### COMET HIGH BASE SMOKELESS POWDER LOADED SHELLS.



Wt. of Box of Shot Shot

[illegible] 10 Grs. 28

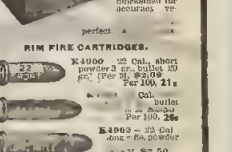
| | | | | |
|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

owder are loaded with "Robin" smokeless powder and chilled shot

| | | | | | |
|---|---|---|---|---|---|
| K3281 | 3 | dr. | 1 | | |
| K3283 | 3 | " | 1 | | |
| K3337¼ | 3 | " | 1 | | |
| K3344 | 3¼ | " | 1¼ | " [illegible] | [illegible] |
| K3340 | 3¼ | " | 1⅛ | " 6 | 2 40 23.85 |
| K3347¼ | 3½ | " | 1⅛ | " [illegible] | [illegible] |

Try this excellent line. Its merits will win trade for both of us.

### "ROBIN HOOD" METALLIC CARTRIDGES.



Loaded with [illegible] Standard [illegible] chamber, ed by expert [illegible] nmen for accuracy, ve [illegible] perfect [illegible]

### RIM FIRE CARTRIDGES.

K4000 — 22 Cal., short, powder 3 gr., bullet 29 gr. (Per M, $2.00) Per 100, 21c

K4001 — 22 Cal., [illegible] bullet [illegible] Per 100, 28c

K4002 — 22 Cal., long [illegible] powder [illegible] M. $2.50 [illegible] 24c

K4003 — [illegible] smokeless [illegible] 21c

### CENTER FIRE S. & W. CARTRIDGES.

K4004 — 32 Cal., powder 12 gr., ball 86 gr. (Per M, $7.50) Per 100, 75c

K4005 — 38 Cal. [illegible] 94c

### BLANK CARTRIDGES.

50 in box [illegible]

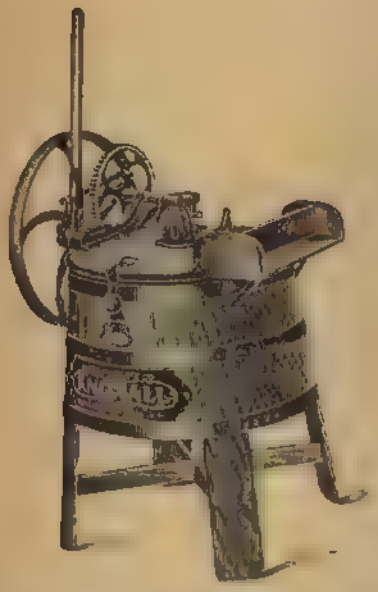
K4006—22 C. [illegible] for 3 s. [illegible] 1M cartr [illegible] Per M [illegible] 1¼

32 Cal. center fire S. & W., powder, box, 500 in carton [illegible] 1 40 Per C. [illegible] 66c

K4008—38 center fire S. & W., powder 14 gr., 50 in box, 250 in carton [illegible] 1 60 [illegible] 66c

# The Knoxall High Speed Lever Washer

**BALL BEARING**

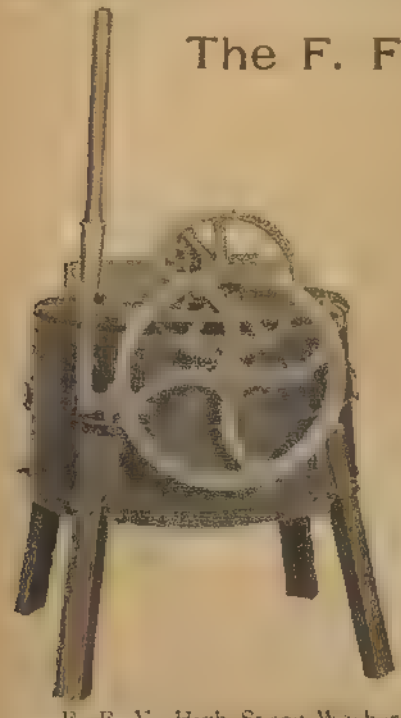


Embodying all the best features of the latest and most modern machine for the quick washing of clothes

The Knoxall High Speed Washer is equipped with a strong and simple mechanism as provided with a large, well balanced fly wheel which makes five full revolutions to one forward and back stroke of the lever. The tub is made of the best Louisiana Red Cypress lumber. All joints are tongued and grooved with three extra heavy steel hoops. Finish of the tub natural color of the wood, hoops and mechanism are aluminum bronzed.

| | Each |
|---|---|
| **Knoxall Washer** | $15.00 |

# The F. F. V. High Speed Rotary Washer



As the name implies, this is the "Fast Flying Virginia" High Speed Washer—geared for best service.

F. F. V. High Speed Washer is geared up to a shaft with a well balanced heavy weight fly wheel. The lever is direct geared to the mechanism, has a forged steel pitman rod which drives the machine with great power and speed, but with little labor. Virginia White Cedar tub with electric welded galvanized wire hoops. Cannot fall off the tub. **Is steam tight.**

| | Each |
|---|---|
| **F. F. V. Washer** | $15.00 |

# A Word TO THE Dealer ABOUT Knox

Mrs. J. N. Cuneo and the Knox Giant
The feature of the Mardi Gras meet

**1909 MODELS**

In producing models 'M' and 'O' our aim has been not only to build cars superior to any in quality and construction, but in every way possible to meet the demands of the automobile public as to what constitutes the perfect motor car. We have also made every effort to prove that our stock cars are the fastest, as well as the most reliable and efficient, by winning more contests, both in speed and hill climbing, in 1908, than any other make of car, irrespective of power or selling price. To be able to win so consistently from all makes regardless of power or selling price, proves the **Superiority of Knox Construction.**

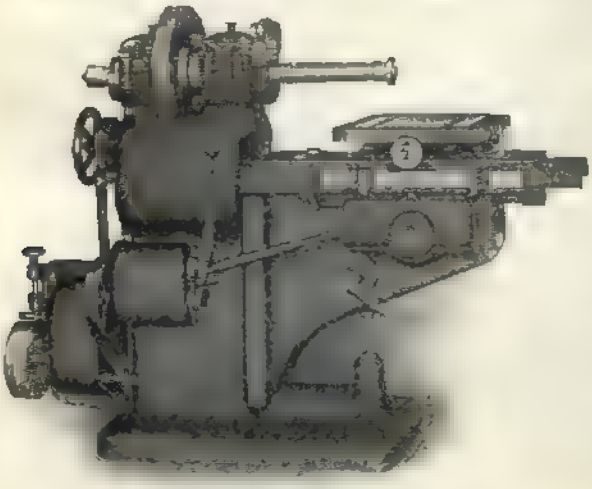
Knox cylinder construction with valves in the head, detachable heads, unit power plant and three point suspension, straight line drive, a perfect lubricating system, coupled with high-class construction and material, make them **able to win contests as well as customers. MR. DEALER,** the car having the most good qualities is the easiest as well as the best to sell. **Send for illustrated catalogue**

**KNOX AUTOMOBILE COMPANY** Member A. L. A. M. **SPRINGFIELD, MASS.**

# A Big Step Forward

**IS MADE WHEN YOU ADOPT**

# HEALD GRINDERS



## The Heald Cylinder Grinder

solves the whole problem of finishing your cylinders.

No more expense for reamers or for keeping reamers sharp.

No cylinders oversize when reamers are sharp, and undersize when reamers are dull.

No matter whether the iron is hard or soft, it's all the same.

The only satisfactory and successful machine and method on the market today.

**The Heald Machine Co.,** 14 New Bond Street **WORCESTER, MASS.**

# Levels

Cherry Stained, Polished, Assorted Lengths

| No. | Length | Per Doz. |
|---|---|---|
| 102–10 | to 16 in. | $ 5.10 |

One-half Doz. in a Box

Machinists, Iron, Nickel Plated

| No. | Length | Per Doz. |
|---|---|---|
| 39½– | 6 in. | $ 6.00 |

One-half Doz. in a Box

Nickel Plated, Adjustable, Ground Glasses
V Bottom for Shafting

| No. | Length | Each |
|---|---|---|
| 34V | 4 in. | $1.25 |
| | 6 in. | 1.50 |
| | 8 in. | 2.00 |

One in a Box

## POCKET LEVELS

Iron Body, Japanned, Iron Top Plate

| No. | Length | Per Doz. |
|---|---|---|
| 40–3¼ | in. | $ 1.60 |

Iron Body, Japanned, Brass Top Plate

| | | |
|---|---|---|
| 41–3¼ | in. | $ 1.80 |

One Doz. in a Box

Nickel Plated, Hexagon

| No. | Length | Per Doz. |
|---|---|---|
| 31 | 3 in. | $ 5.10 |
| | 4½ in. | 7.80 |

One-half Doz. in a Box

## BIT AND SQUARE LEVEL

Brass, with Proved Glasses
Can be readily attached to Bit or Square

| No. | Per Doz. |
|---|---|
| 44 | $ 3.60 |

One-twelfth Doz. in a Box

## LEVEL GLASSES

Proved

| Length | Per Doz. |
|---|---|
| 1, 1¼, 1½ and 1¾ in. | $ 1.10 |
| 2 in. | 1.20 |
| 2½ in. | 1.30 |
| 3 in. | 1.40 |
| 3½ in. | 1.60 |
| 4 in. | 1.80 |

Ground

| Length | Per Doz. |
|---|---|
| 1 in., Level | $ 6.00 |
| 3 in., Level | 10.00 |

One Doz. in a Box

## LEVEL SIGHTS

| No. | | Per Doz. Pairs |
|---|---|---|
| 1 | For Wood Levels | $ 9.00 |
| 2 | For Iron Levels | $9.00 |

One Pair in a Box

# Plumbs and Levels

## VICTOR

Selected Straight Grained Cherry Proved Glasses set in Metal Cases, Adjustable Square Top Plate Two Brass Lipped Side Views. Brass Tipped. Two Plumbs. Proved Glasses.
A high grade Level at a moderate price.

| No. | Length | Per Doz. |
|---|---|---|
| 14–26, | 28 or 30 in. | $21 84 |
| 15–26, | 28 or 30 in. **Triple Stock** | 24 00 |

One Dozen in a Box

Brass Bound Two Brass Lipped Side Views
With Ground Glasses

| No. | Per Doz. |
|---|---|
| 95–Mahogany | $72.00 |
| 96–Rosewood | 80 00 |

24, 26, 28 or 30 inches long. One-twelfth Doz. in a Box

Rosewood Machinists
Brass Bound Two Brass Lipped Side Views
With Ground Glasses

| No. | Per Doz. |
|---|---|
| 98–12 in. long | $38.00 |

One-twelfth Doz. in a Box

## METALLIC

Style of 6 and 9 inch

Style of 12, 18 and 24 inch

With Grooved Bottoms

**No. 36 G**
Japanned, Nickel Plated Trimmings
With Proved Glasses, Two Plumbs

| Length | Each |
|---|---|
| 6 in. | $1 25 |
| 9 in. | 1 50 |
| 12 in. | 1 75 |
| 18 in. | 2 00 |
| 24 in. | 2 25 |

One in a Box

**No. 37 G**
Full Nickel Plated throughout
With Ground Glasses, Two Plumbs

| Length | Each |
|---|---|
| 6 in. | $2.00 |
| 9 in. | 2.50 |
| 12 in. | 3.00 |
| 18 in. | 3 50 |
| 24 in. | 4 00 |

## MASONS

Cherry Stained, Adjustable, Arch Top Plate, Two Side Views, Polished

| No. | Per Doz. |
|---|---|
| 35–42 in. long, adapted for Plumb Bob and Line | $21.00 |

One-half Doz. in a Wooden Box

Cherry Stained, Adjustable, Square Top Plate, Two Side Views, Two Plumbs Proved Glasses

| No. | Per Doz. |
|---|---|
| 45¼–48 in. long, 3½ in. wide, 1 ⅛ in. thick, adapted for Plumb Bob and Line | $36 00 |

One-half Doz. in a Wooden Box

Decorate Your

AUTOMOBILE
OR MOTOR BOAT

WITH A

LUNKENHEIMER EAGLE

A most attractive ornament and an elegant design. Made of a good bronze composition, nicely finished, and will maintain its appearance indefinitely with very little attention. Made in three sizes—measuring 2¼, 8 and 12 inches respectively, from tip to tip of wings.

There are other makes on the market, but the prettiest and neatest have the name **Lunkenheimer** on them. Your local dealer can obtain them for you, but if he will not, write us.

**Write for Automobile and Motor Boat Book**

THE LUNKENHEIMER COMPANY

**Largest Manufacturers of High Grade Engineering Specialties in the World**

General Offices and Works: CINCINNATI, OHIO, U. S. A.

BRANCHES { NEW YORK - 66-68 Fulton St.
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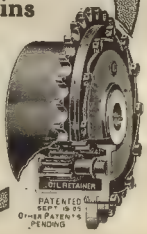
For Diamond, Baldwin and Whitney Chains

Differentials

Sprockets in stock and to order

Cullman Wheel Co.
1340 E. Greenwood Terrace
Chicago



# Spicer Universal Joints are STANDARD

All others **CLAIM** to be "just as good as SPICER." Don't be deceived. **Construction:** Simple, durable, efficient, compact, dust-proof. OIL-TIGHT—holds lubricant sufficient for many months of ordinary use without attention. All parts interchangeable. There are *absolutely no nuts, bolts, screws, pins* or other fastenings on which any strain is produced by the power transmitted.

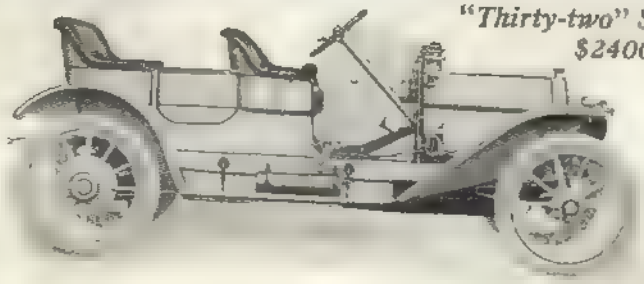
## "Spicer Quality–The Best Possible"

**SPICER UNIVERSAL JOINT MFG. CO.**
**3 MADISON AVENUE : : : PLAINFIELD, N. J.**

**Representatives, L. D. Bolton, 319 Hammond Bldg., Detroit, Mich.**
**Thos. J. Wetzel, 29 W. 42nd St., N. Y. City**
**Factory Sales Representative, K. Franklin Peterson, 166 Lake Street, Chicago, Illinois**

# THE MARMON

"A Mechanical Masterpiece



*"Thirty-two" Suburban, $2400*

Whoever esteems a car's reliability and length of life as a vital factor in its actual value, will find the 1909 Marmon models intensely interesting. Manufactured entirely by us and unsparingly equipped.

*The "Thirty-two," $2400. The "Fifty" (7 Passengers), $3750.*

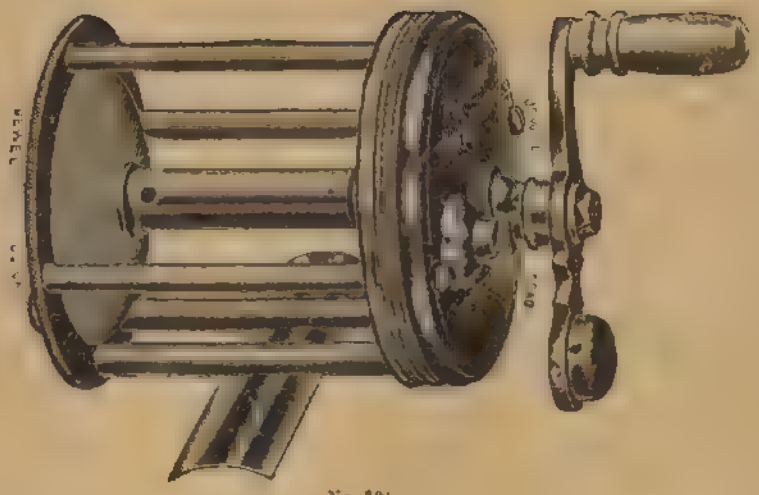
Nordyke & Marmon Co. (Estab 1851), Indianapolis, Ind.

*Standard Mfrs. A. M. C. M. A.*

## The Easiest Riding Car In The World

# Fishing Reels

## CASTING

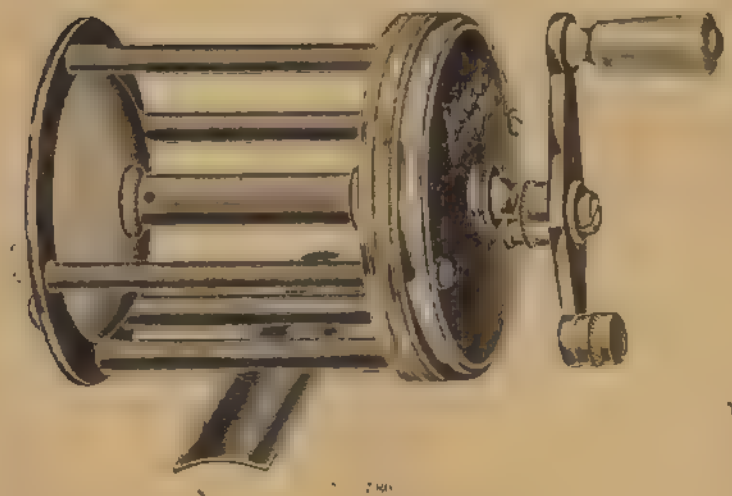


No. 584

**MASCOT CASTING, NICKEL PLATED**

Steel Pivots and Pinions, Oil Cups over Bearings
Long Spool, Adjustable Click and Drag
White Bone Handle

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 60 | 2 in. | $30.00 |



No. 585

Extra Fine Quality
Nickel-Plated, German Silver Finish
Adjustable Click and Drag

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 60 | 2 in. | $48.00 |

No. 586

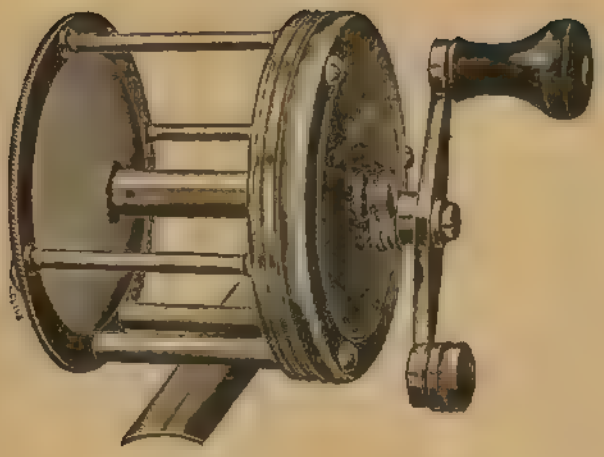
Same as No. [illegible] with Jewel Bearings

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 60 | 2 in. | $66.00 |

One Reel in a Box

# Fishing Reels

## SURF



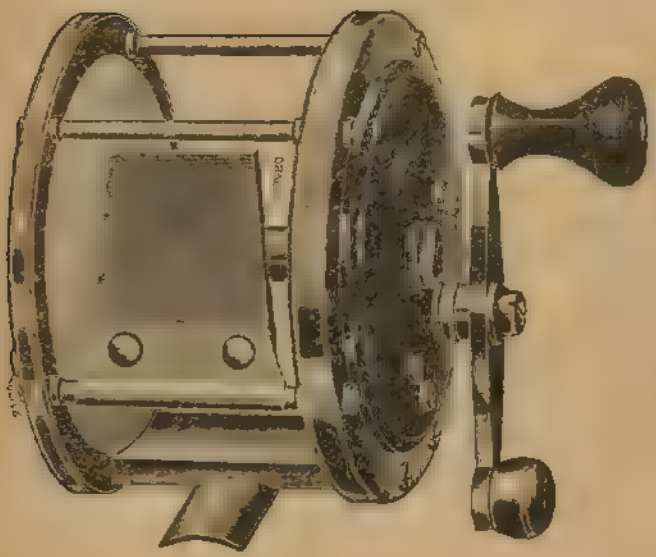
No. 860—Cut ¾ Size

**No. 860**

Nickel-Plated

Extra Strong, Steel Pivots, Pinion Cover

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 200 | 3½ in. | $54.00 |



No. 870—Cut ¾ Size

**No. 870**

Nickel-Plated

Extra Strong, Steel Pivots, Rubber Plates with Reinforced Metal Edges, Leather Thumb Drag

| Yards | Diam. Disk | Each |
|---|---|---|
| 200 | 3 in. | $ 8.75 |
| 250 | 3½ in. | 10.00 |
| 300 | 3¾ in. | 11.25 |
| 350 | 3⅞ in. | 13.75 |
| 450 | 4⅜ in. | 17.50 |

One Reel in a Box

# HOT WEATHER Sellers in Glassware

**"CLIMAX" JUG ASSORTMENT.**

1C1837 [illegible] 95c

**MASSIVE BRIGHT JUG ASSORTMENT**

*Design and quality not usually found at such a low price.*

1C1838 [illegible] 88c

**"RICHEST QUALITY" JUG ASST.**

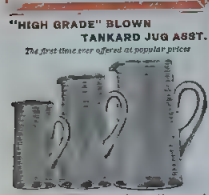
*Designed and finished on the genuinest glass principles. They are bargains at price quoted.*

1C1882—Full ½ gal sizes, heavy cut [illegible] 4 shapes, large few, fancy, Grecian and others; ¼ doz. each design. Total 2 doz. bbl. 120 lbs. Per dozen. $1.95

**"MAMMOTH BEAUTY" ASST**

*Note the size and price and we know your order will come our way.*

1C1884 [illegible] $1.80



**"HIGH GRADE" BLOWN TANKARD JUG ASST.**

*The first time ever offered at popular prices*

1C1885 [illegible] blown fine quality crystal, [illegible] cup, silk with hand made [illegible] handles. 1 doz. each, asst. [illegible] bbl. 6, 8 and 9½ lbs. $2.12

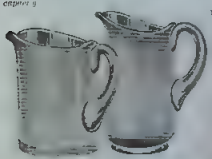
**WATER BOTTLES.**

1C1871 [illegible] $2.25

1C1870 [illegible] quart full size, 8 in. finest [illegible] crystal, rich, heavy deep cut pattern with colonial neck, brilliantly fire polished. ½ doz. in pkg. Per dozen, $2.25

**"JUMBO" STUCK HANDLE JUG ASSORTMENT.**

*Extremely popular. Note the extraordinary capacity.*



1C1887 Mammoth glass, mirror finished genuine stuck handles. Asst. [illegible] 45c

**"NEAR CUT" LIQUOR SET.**

1C1895 [illegible] 60c

**"BIG STAPLE" WATER SET.**

*Sellers as ever but still more attractive in design.*

1C1925—Finished crystal, rich optic pattern, rosette bottoms, attractive shapes, 4 pcs. tankard jug, ht. 7¾ in. and SIX full size tumblers to set. Total 13 sets in bbl., 115 lbs. Per set. 32c

**"ETCHED GRAPE VINE" WATER SET.**

*A new design and one that will sell*

1C1924 [illegible] 69c

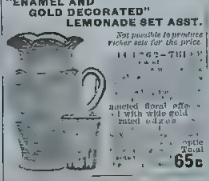
**"ENGRAVED BLOWN" WATER SET ASST**

*Quaint engraving on shapely models*

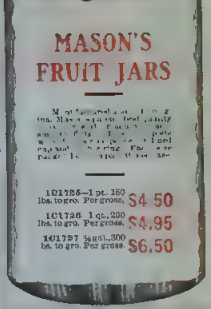
1C1931—Thin blown [illegible] FOUR large [illegible] 60c

**"ENAMEL AND GOLD DECORATED" LEMONADE SET ASST.**

*Not possible to produce richer sets for the price.*



1C1962—THIS [illegible] enameled floral effect with white gold [illegible] edges [illegible] Total 7 pcs. 65c




1C1726—1 pt. 250 lbs. to gro. Per gross, $4 50

1C1726 1 qt. 200 lbs. to gro. Per gross, $4.95

1C1727 ½ gal. 300 lbs. to gro. Per gross, $6.50

**"ST. REGIS" NEARCUT STAR 7 PC. WATER SET.**

*A high class, up to date design and pattern.*

1C1928 [illegible] 69c

**SUNBURST NINE SET**

45c

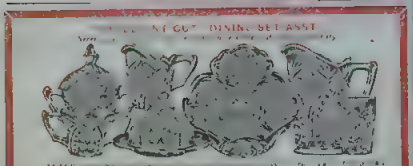
**"ELEGANT" FLORAL & GOLD DECORATED WINE SET ASST.**

1C1938—3 shapes, large qt. blown stuck [illegible] decanter, SIX assn. glasses, rich crystal, allover geometrically [illegible] floral decorations, gold bands and [illegible] 1 set each shape. Total 3 sets in box. 18 lbs. Per set. 75c

**"WALDORF" PRESCOT WATER SET ASST**

1C1930—The up to date [illegible] cut shape jugs, ht. 9½, massive bell [illegible] each [illegible] 65c

**"ROYAL" CUT DRINK SET ASST**



14 lbs. [illegible] table [illegible] 8 6 tumblers [illegible] w/l creamer, spoonho[illegible] Total 13 sets in bbl. Per set 17½c

**GARDEN CULTIVATOR**

1H2015 [illegible] $1.72

**WHEELED PLOW**

1H3037 2 wrought steel spoked wheels, diam. 16 and 14 in., heavy 1x1¼ in. steel frame connected to wheels and bolted to handle, green enameled red striped frame and wheels, varnished oak handle, top part painted red. Each plow complete, with 1 bull [illegible] $2.35

**5 TOOTH STEEL CULTIVATOR.**

1H3046 [illegible] powder, so fit and strong, narrows cultivator to 9 in., expands to 27 in., steel parts painted Each. $2.78

**14 TOOTH STEEL HARROW.**

1H [illegible] ...ss, 2 outside steel handle braces and arms, expands from 16 to 40 in., steel parts painted, green [illegible] Each. $2.80

**DOUBLE SHOVEL PLOW.**

1H3039 [illegible] in shovels, varnished handles, bolted and [illegible] parts painted red [illegible] Each. $1.82

**WING SHOVEL PLOW.**

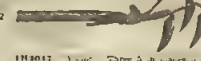
1H3036 [illegible] hilling or furrowing in potatoes or corn. Each. $1.95

**HANDY STEEL ONE HORSE PLOW.**

1H3038 Steel plow with wood beam and 2 crooked hardwood handles, adjustable slip shoe. The shares are hardened and have a layer of special steel on point, as shown with each plow. In [illegible] Each. $2.10

(Shares for above 50c each.)

**ADJUSTABLE HAND GARDEN CULTIVATOR.**

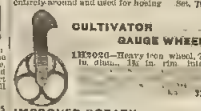


1H3017 [illegible] Three 5 in. blades, [illegible] ...justment, 3 inches across, blued [illegible] ½ in. hardwood handle, ½ dee. in [illegible] Each. $7.20

**HORSE HOE ATTACHMENT.**

1H3044—To be used in connection with 1H3038 [illegible] blades 14½ x 8½ with adjusting attachment, can [illegible] blade can be set at any desired angle and swung entirely around and used for hoeing Set, 75c

**CULTIVATOR GAUGE WHEEL.**

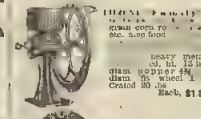


1H3062—Heavy iron wheel, 7½ in. diam., 1¾ in. rim. Inter- [illegible] 32c

**IMPROVED ROTARY HAND CORN PLANTER**

1H3050 [illegible] handles securely bolted. Has a positive feed. Simple and easy to operate. Complete with 4 discs—one for peas or broom corn, to drop 1 grain at a time, 1 to drop 2 and 3 to [illegible] (Singly each, 01c) Each. 60c

**HAND CRIST MILLS.**



1H3051 [illegible] grain corn meal [illegible] etc. also feed [illegible] heavy metal [illegible] ...ol, fit 15 in., diam. hopper [illegible] diam. fly wheel [illegible] Crated 30 lbs. Each. $1.80

1H3055, "Powerful" Grinds corn, grain, etc. Adjustable to fine or coarse, grinds 20 lbs. [illegible] diam., hopper [illegible] chest [illegible] table [illegible] $2.00

1H3056 [illegible] hopper 3¾ Crated 37 [illegible] $2.50

1H3057 "Giant" [illegible] 15 [illegible] 08½ diam. steel alloy grists. Grinds all kinds dry beans [illegible] Adjusted to fine or coarse. Grinds 1½ to 3 bushels per hr. Each. $5.25

**"IRON KING" CORN SHELLER.**

1H3053—No small sprigs or parts to break loose or get out of order. Capacity 8 to 10 bushels per hour 12 lbs. Each. 65c

# LAWN MOWERS FOR 1909.

**Standard grades throughout.** Item for item this line is the equal of any in America. Compare both price and quality and you will be convinced that it will pay you to give us your lawn mower business.

1H1935, "Home"—16 in. cut, 7½ in. drive wheel, 3 blade cutter bar, thoroughly adjustable, bronze journal bearings, self sharpening. Finished green with red revolving cutter [illegible] $1.85

1H1936, "Cottage"—14 in. cut, 7½ in. driving wheel, 3 blade red cutter bar, high speed adjustable phosphor bronze journal bearings, steel blades, simple adjustment, self sharpening. Green with black and gold trimming, red revolving cutter bar. Rear handle bar [illegible] $1.98

1H1937, "Speed [illegible] ratchet, 16 cut [illegible] in diam. Light green, trimmed with red and gold, center of driving wheel in deep red. Easy running and reliable. Each [illegible] $2.35

1H1938, Lawn [illegible] priced number [illegible] ...ter [illegible] 14 [illegible] $2.25

1H1939, "Clipper"—16 in. cut, 8 in. driving wheels, painted light blue, gold bronze trimming, 3 steel blades finished in red and gold bronze, Black japanned finish bronze, perfect ratchet adjustment, warranted. Each. $2.35

1H1940, "Red Peerless" 16 in. cut, 8 in. [illegible] ¾ in., self sharpening, easy running, [illegible] pany, selected handle [illegible] Each. $2.90

1H1941 [illegible] Lawn Mower [illegible] Wheel [illegible] [illegible] Each. $3.95

**"MASTER MECHANIC" BALL-BEARING LAWN MOWERS.**

Highest grade manufactured, warranted. Have every up to date improvement. The following are full ball bearing

1H1942, "Superior"—16 in. cut, 8 in. driving wheels, 4 cutter blades, 9¼ in. diam., perfect adjustment. Easiest working, will outwear many of the old style. Alum num bronze finish, gutted in high colors, red revolving cutter bar, center of driving wheels in carmine..... Each. $4.15

1H1943, "Standard"—As 1H1942, 18 in. cut, 9¼ in. driving wheels, 5 in. revolving cutter. Will cut other short or long grass. Each. $5.50

1H1944, "King"—18 in. cut built on the knee [illegible] 9¾ in. in diam. Ball [illegible] running, finely finish- Each. $7.75

**"MASTER MECHANIC HIGH GRASS LAWN MOWER.**

Highest grade

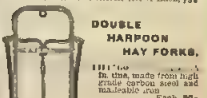
1H1945 Master [illegible] ...and center of d... $3.50

**ADJUSTABLE GRASS CATCHERS.**

1H1... Fits all low wheeled mowers from 10 to 18 in., [illegible] heavy gauge steel wire rod frame. Each 32c

1H1950-Fits all kind of wheel [illegible] ...ers [illegible] 20 in. heavy canvas, steel rods [illegible] ...sive, extra deep, easily adjusted. ..... Each. 55c

1H10 —"Belmont." For all high and low wheel mowers, 16 in., and smaller. Will [illegible] from 6 to 20 in. mower. Made of serged [illegible] Adjustable with durability. Designed for those who want the best grass catcher made..... Each. 75c



**DOUBLE HARPOON HAY FORKS.**

1H1[illegible] ...in. tine, made from high grade carbon steel and malleable iron Each. 80c

1H1701—31 in. tines otherwise as 1H1700 Each, $1.00

**DO NOT FORGET** that ALL our Farm and Garden Tools are strictly STANDARD. They are the regular goods made for us by the largest maker of this line in America.

# MASTER MECHANICS' TOOLS—Contd.

### "MASTER MECHANIC" PLIERS.

Flat Nose Pliers
... drop forged high grade steel hand full polish ... tool ... in box.

... ed steel jaws. ... k finish hand ... doz. in box.... Doz. $3.40

1H167, Combination Pliers
... drop ... highest grade tool steel jaws finely tempered, cross cut to 32 in. full nickel plated. 7 in box

... Side Cutting Pliers — Drop forged carbon tool steel jaws, tempered ... lap joint, face and jaws full mirror finish. Black finish ... lb. 40 ... in box
... Doz. $3.95
... Doz. $5.80

### "MASTER MECHANIC" WING DIVIDERS

... nickel ... & best ... ble steel, points carefully tempered, ... outlet. 100 ... & dos. to box ... full nickel plated and polished. ... Doz.

1H005—8in. 8 in. ½ doz. in box Doz. $3.00

### "MASTER MECHANIC" CALIPERS.

1H111, Outside ... steel ... and ... nickel ... with ... measure ... diam. ... to 7 in. ... Doz. $1.50

1H113, Outside ... measures to ... diameter ... 3½ doz. in box ... $1.95

1H110, Inside ... Finest grade tool steel, full polished ... ... saves inside diam. from ... to ... ed measure. ... doz. in box. ... $1.95

### "MASTER MECHANIC" MASON'S TROWELS.

1H099, Pointing—8½ ... pieces forged crucible steel tempered pastry tang, polished hardwood handle brass ferrule. ½ doz. in box.... Doz. $1.95

1H074, Brick ... drop forged crucible steel, polished hardwood handle, steel ferrule. ½ doz. in box. Doz. $4.60

1H028, Brick—11 in. Philadelphia pattern, forged from one piece crucible steel, high grade polished hardwood handle ... ½ doz. in box. $4.95

1H028, Plastering, 11x4½ ... pieces ... steel, polished ... malleable shank ... hardwood handle. ½ doz. in box. Doz. $5.00

### "MASTER MECHANIC" SET OF STONE CUTTERS' CHISELS.

*Standard grade, fully warranted. The stone cutter of your town will appreciate the precious cut teeth.*

Each tool hand forged from highest grade Columbia crucible steel by experienced workmen. Every one warranted perfection in temper and shape.

1H433—1 each 12 popular assorted shapes, as follows:
1 hammer head pitching tool, 3¼ in. blade, ¾ in. octagon stock.
1 hammer head pointing tool, ¾ in. octagon stock.
1 mallet head pointing tool, ¾ in. octagon stock.
1 mallet head lifter ¾ in. octagon stock.
1 each 1, 1¼, ½, ¾ in. mallet head tooth chisels, ¾ in. octagon stock.
Packed in wood box, 10 lbs.
Per set, **$2.50**

### HIGH GRADE "MASTER MECHANIC" TINNERS' SHEARS.

*Compare with any other—both quality and prices*

High Grade Crucible Steel Snips
Hand forged, tempered in oil, blades nickel plated, handles double coated, black japanned finish. Each in box

1H137, 8½ in. long, 3 in. cutting blade. 1 in box. Each. **56c**

1H136—11¼ in. long, 4 in. cutting blade. 1 in box. Each. **82c**

1H134, 12¾ in. long, 4 in. cutting edge. 1 in box. Each. **85c**

1H135—13 in long, ¾ in cutting ... box. **$1.10**

1H518—12¾ in. long, 3 in. beveled cutting blade. 1 in box. Each. **80c**

1H151—14 in long ... cutting blade. 1 in box. Each. **$1.20**

1H150 ... long ... edged ... and handles baked on. ... Each. **$1.25**

### "MASTER MECHANIC" SWIVEL BASE MACHINISTS' VISE.

1H621—4 in ... jaws, open ... in. swivel base, can be ... works in V channels, gives positive grip, 12 in. turning bar, head, bar, jaws and clamping bolt full polished, top of vise full black. Each warranted not to break. Wt. 90 lbs. ... Each. **$8.25**

### "MASTER MECHANIC" MOUNTED OIL STONE.

1H1068—7x2, extra ... grade ... ... ...

# MASTER MECHANICS' TOOLS—Contd.

### "MASTER MECHANIC" AUGER BRACES.

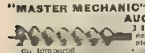
1H2X5 ... ratchet, 10c. steel jaws, full nickeled, ... handle, ... lished head and grip, warranted. ... dia. in box Doz. $8.75

1H2X7 ... grade, 10-in sweep ... ratchet, ... and grip cocoabolo, hexagon ... plated throughout, internal ... ½ dia. in box ... $ 10

1H2X8 ... on Drill Brace ... handle cocoabolo wood, ... nut check with ... inclined steel ... alligator jaws, ... between head and ... ratchet ... ed solar used to start drill. One of the largest and best selling tools in the market. Warranted. Each $1.50

1H260, Corner Bit Brace—10 in. sweep, 16 in. long, all parts tool steel, highly nickeled head and grips, selected cocobolo gears cut from crossbile stock by patent process, almost frictionless, full fluted chuck with alligator jaws, takes either round or square shank tools. Each wrapped. Warranted ... Each, $2.50

### "MASTER MECHANIC" AUGER BITS.

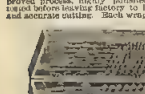


1H750—Eight ... best grade carbon steel carefully ... co. tempered ... especially ... wrapped ... Doz. 1.85 12-16 ... 2.25 18-20 ... Doz. 2.50 ... 3.00

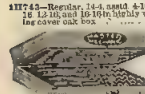
### "MASTER MECHANIC" AUGER BITS.

Jenning's improved pattern extension lipped auger bits.

Highest grade carbon steel, ... improved process, highly polished, every one tested before leaving factory to insure perfect and accurate cutting. Each wrapped.



1H743—Regular, 14-4, sand 4-16, 6-16, 8-16 10-16, 12-16, and 16-16 in, highly varnished, sliding cover oak box ... Set, $1.20



... compartment oak box ... $3.00

### "MASTER MECHANIC" SINGLE TWIST AUGER BITS.

1H745—Ratchet quid ... and spur bo ... lip ... ... head, warranted. Having but one lip and one spur they offer little resistance. Assort. 4 to 10 in. wrapped, 5 bits to an envelope, 5 envelopes in varnished hardwood box. ... Set, $1.50

### "MASTER MECHANIC" BIT STOCK DRILL SET.

1H5... Drop forged high-est grade ... steel, oil tempered, equal to best drill made. 5 drills in ... ... ...

# MASTER MECHANICS' TOOLS—Contd.

### "MASTER MECHANIC" AUGER BRACES.

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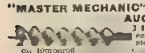
### "MASTER MECHANIC" AUGER BITS.



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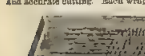

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... compartment oak box ... $3.00

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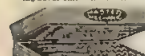

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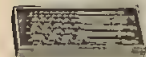

1H5... Drop forged high-est grade crucible steel, oil tempered, equal to best drill made. 5 drills in ... 1 ... 2 ... 3 ... 4 ... 5 ... 6 ... 7 ... 8 ... 9 ... 10 ... 11 ... 12 ... 13 ... 14 ... 15 ... 16 ... 17 ... 18 ... 19 ... 20 ...

# MASTER MECHANICS' TOOLS—Contd.

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1 hammer head pointing tool, ¾ in. octagon stock.
1 mallet head pointing tool, ¾ in. octagon stock.
1 mallet head lifter ¾ in. octagon stock.
1 each 1, 1¼, ½, ¾ in. mallet head tooth chisels, ¾ in. octagon stock.
Packed in wood box, 10 lbs.
Per set, **$2.50**

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*Compare with any other—both quality and prices*

High Grade Crucible Steel Snips
Hand forged, tempered in oil, blades nickel plated, handles double coated, black japanned finish. Each in box

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### "MASTER MECHANIC" MOUNTED OIL STONE.

1H1068—7x2, extra ... grade ... ... ...

# Matheson

**Cup Winner in 300 Miles Endurance Contest, Philadelphia to Wilkes-Barre and return, January 1-2, 1909.**

**Only THREE out of THIRTY-TWO CONTESTANTS finished with perfect time scores; THOSE THREE WERE four-cylinder MATHESONS.**

**50 H. P.—Six-cylinder Shaft Drive, $3,000**

Equipped with choice of Touring, Tourabout, Toy-tonneau, Close-coupled or Runabout bodies.

**50 H. P.—Four-cylinder Chain Drive, $4,500**

Equipped with Touring body, Limousine or Landaulet, $5,500
Roadster or Tourabout, $4,350

## Matheson Automobile Co.

MAIN SALES OFFICE, GARAGE AND REPAIR DEPT.

1886-1888 Broadway, Cor. 62d St., New York City

# The 1909 "BRICTSON" DETACHABLE TREAD

Did you see it at the MADISON SQUARE GARDEN SHOW, New York City or at the Second Regiment Armory Show, at Philadelphia or at the Second Annual Automobile Show in Minneapolis? If not, you missed the BEST part of these shows.

You all know that the TIRES are the most vital part of your car equipment, but you will possibly say "We have tried them all or everything that has come along and we have been disappointed." But you have NOT tried the 1909 "BRICTSON," which is positively GUARANTEED TO STAY ON.

No adjustments to make, once on and that is the end of it, and the beauty of it all is that the "BRICTSON" is strictly "QUICK DETACHABLE"; no bother whatever in changing a tube, as it can be done just as quickly as if you had only the rubber casing.

We are willing to place a set of the "BRICTSON" detachable treads on any car that may enter the 1909 Glidden tour if they will only give us the chance, and we feel certain that the car equipped with the "BRICTSON" will finish with a PERFECT tire score.

Remember the "BRICTSON" tread takes ALL the wear of the road including ruts, etc., and it entirely envelopes the tire proper excluding sand stones mud, and water from coming in contact with the casing; also positively prevents BLOW-OUTS.

The "BRICTSON" DETACHABLE TREAD is a better investment, and will pay you a larger dividend than any equipment on your car. Write for circular

**THE BRICTSON MFG. CO., Cor. Main & 6th Streets**
**BROOKINGS, S. D.**

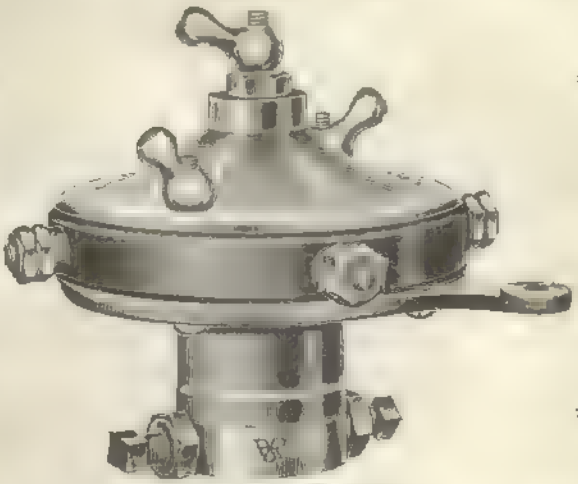
# The MAXIMUS Makes Motors Mote

Over 12,000 satisfied users If you are not one of them, you should be; they save your temper, time and money.

Patented June 2 1908

**More Speed**

**More Power**



THE MAXIMUS TIMER

**Less Plug Trouble**

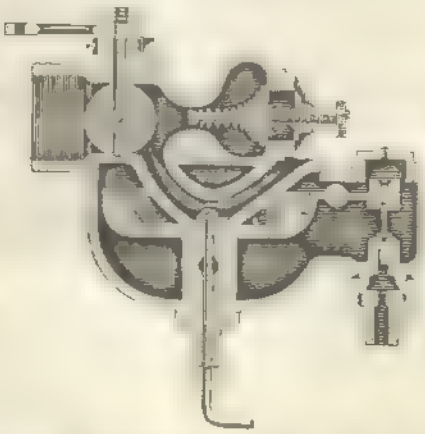
**Less Coil Trouble**

**We know** we have the best timer made, and that it will improve the speed power and smooth-running qualities of your motor; if it does not, your money will be refunded without argument. 85 per cent of 1908 model machines are equipped with roller type timers. The Maximus is constructed on the principle of the best of these, but has several improved features that overcome the weak points of roller-type timers, and make the motor mote. A special Maximus, designed to be easily applied to 2-cylinder Buick and Models M and N Ford is now ready for delivery.

The unprecedented success of the Maximus Timer encouraged us to experiment in carburetion, and, after careful testing and improving, we are now ready to offer

## The MAXIMUS CARBURETOR

**Simplified Carburetion**



**List Price**

**1-inch Size, $11.00**

**1½-inch Size, $12.00**

The principal feature is the improved method of applying both the constant and compensating air. The small opening for the constant air creates a strong vacuum on the nozzle, resulting in throttling to very slow speed and ease in starting. The method of applying the compensating air does away with the sudden increased rush of air on the spray nozzle at change of throttle.

MADE BY

**The BECKLEY RALSTON CO., 80-82-84 Michigan Avenue, CHICAGO, ILL.**

# Mortars and Pestles

Ground Inside

| Size, Quarts | Height, inches | Weight, Pounds | Each |
|---|---|---|---|
| ½ | 3½ | 6½ | $ 1 00 |
| 1 | 5 | 9 | 1 25 |
| 2 | 6 | 16 | 2 00 |
| 4 | 7½ | 22 | 3 00 |
| 6 | 8½ | 37 | 4 75 |
| 8 | 9 | 43 | 5 50 |
| 12 | 11 | 72 | 9 00 |
| 16 | 12 | 86 | 10 75 |

# Retorts

**Nevada, Oval Top**

| Size Parts | Holds Quarts | Net Lbs | Each |
|---|---|---|---|
| 1 | 12½ | 10 | $ 4 50 |
| 2 | 25 | 15 | 5 50 |
| 3 | 38 | 18 | 7 00 |
| 4 | 50 | 25 | 8 00 |
| 5 | 63 | 31 | 9 00 |
| 6 | 75 | 44 | 10.50 |
| 10 | 125 | 65 | 12 00 |

# Miners Gold Pans

**American Iron**

Pressed from one piece, seamless, 16½ in. Diam.

| No | Per Doz. |
|---|---|
| 41–Plain | $ 6.00 |
| 42–Polished | 7.50 |

# Solder Pots

No. 2907

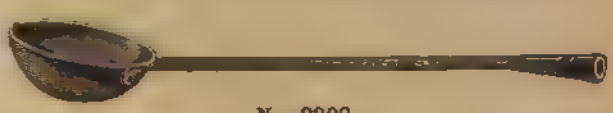
| Diam. in. | Each |
|---|---|
| 5 | $ 0.50 |
| 8 | 1.10 |
| 10½ | 1.75 |

# Wrought Iron Ladles

No. 2905

| Size in | Per Doz. |
|---|---|
| 2½ | $ 2.50 |
| 3 | 3 00 |
| 3½ | 3.50 |
| 4 | 4.00 |
| 4½ | 4 50 |
| 5 | 5 00 |
| 6 | 6.00 |

# Heavy Socket Ladles



No. 2908

| Size in | Per Doz. |
|---|---|
| 6 | $18.00 |
| 7 | 22 00 |
| 8 | 27 00 |
| 9 | 36.00 |
| 10 | 44 00 |

# Hollow Ware

Cast Iron Polished

## DUTCH OVENS

With Legs and Bail

Flat Bottom, with Bail

| No | Quarts | Top | Bottom | Depth | Each |
|---|---|---|---|---|---|
| 8 LB- | 5 | 10 in | 9 in | 4¼ in. | $ 1 55 |
| 9 LB- | 6 | 11 in | 10 in. | 4½ in. | 1 80 |
| 10 LB- | 8 | 12½ in. | 11 in. | 5¼ in. | 2.10 |
| 11 LB-12 | | 13¾ in. | 11½ in. | 6 in. | 2.45 |

| No | Quarts | Top | Bottom | Depth | Each |
|---|---|---|---|---|---|
| 8 B- | 5 | 10 in. | 9 in. | 4¼ in. | $ 1 40 |
| 9 B- | 6 | 11 in. | 10 in. | 4½ in. | 1.60 |
| 10 B- | 8 | 12½ in. | 11 in. | 5¼ in. | 1 90 |
| 11 B-12 | | 13¾ in. | 11½ in. | 6 in. | 2 25 |

### With Legs (No Bail)

| No. | Quarts | Top | Bottom | Depth | Each |
|---|---|---|---|---|---|
| 8 L- | 5 | 10 in | 9 in. | 4¼ in. | $ 1 45 |
| 9 L- | 6 | 11 in | 10 in. | 4½ in. | 1.70 |
| 10 L- | 8 | 12½ in | 11 in. | 5¼ in. | 2 00 |
| 11 L-12 | | 13¾ in | 11½ in. | 6 in. | 2 35 |

## KETTLES

Flat Bottom Kettle

Regular Kettle

### Flat Bottom Kettle

| No. | Quarts | Top | Bottom | Depth | Each |
|---|---|---|---|---|---|
| 71- | 6 | 9¼ in. | 8¾ in. | 6¼ in. | $ 0.94 |
| 81- | 7 | 9¾ in. | 8⅞ in. | 6¾ in. | 1.04 |
| 91- | 9 | 10¾ in. | 9⅛ in. | 7 in. | 1.32 |

### Regular Kettle

| No. | Quarts | Top | Bottom | Depth | Each |
|---|---|---|---|---|---|
| 72- | 6 | 9¼ in. | 7¾ in. | 7¾ in. | $ 0.90 |
| 82- | 8 | 10¾ in. | 8¾ in. | 8 in. | 1.00 |

## BULGED POTS

Flat Bottom Bulged Pot

Regular Bulged Pot

### Flat Bottom, Bulged Pot

| No. | Quarts | Top | Bottom | Depth | Each |
|---|---|---|---|---|---|
| 73- | 6 | 9½ in. | 8¼ in. | 7 in. | $ 1.14 |
| 83- | 8 | 10¼ in. | 9 in. | 7 in. | 1.28 |
| 93-1) | | 11½ in. | 10 in. | 7¾ in. | 1.50 |

### Regular Bulged Pot

| No. | Quarts | Top | Bottom | Depth | Each |
|---|---|---|---|---|---|
| 74- | 7 | 9¾ in. | 7¾ in. | 8⅛ in. | $ 1.10 |
| 84- | 9 | 10¾ in. | 8¾ in. | 8⅛ in. | 1.26 |

First on Land, First on Sea,
First in the Hearts of All Motormen
Mosler
Spit Fire
PLUGS
Lead the World
USED BY THE LEADING MANUFACTURERS
MAGNETO TYPE OF ALL SIZES
Made to fit any engine, any thread
Can be had for the asking
Energetic Ignition
Greater Power
INSIST UPON THE TWO PATENTED SIDE CLEANING HOLES
One is not enough!
A TRIUMPH FOR THE SPIT FIRE
The ONLY Plugs in the WORLD that ACTUALLY Spit Fire
INSIST ON THE GENUINE, with Name on Porcelain and Base
A. B. MOSLER & CO. 163 W. 29th Street, New York

# GREYHOUND MOTORCYCLES

are just splendid!

¶ "Away ahead" of all others for comfort.

¶ None of the others has anything like the

**Greyhound Shock Absorber**

to iron out the rough roads.

¶ No other is so simple in construction or so easy to operate.

¶ Find out about the **Greyhound** comfort devices, the split crank case, the one-piece crank shaft, the auxiliary exhaust port, and all the nice points that go to make up **A WORLD BEATER.**

¶ Correspondence wanted with riders and dealers.

¶ Good business offer to agents is ready.

¶ Catalogues for the asking.

**The Auto-Bi Company**
**1453 Niagara St., Buffalo, N. Y.**

## CURTISS Double Cylinder Motorcycles were FIRST IN AMERICA

THEY'RE STILL FIRST IN EVERYTHING

**FIRST IN SPEED**

World's Record (61 cu. in.) 1 Mile 46 2-5 sec.

**FIRST IN RELIABILITY**

Only DIAMOND MEDAL 1907 F. A. M. Endurance run. Highest Award "Both Classes" 1908 F. A. M. Endurance Run.

First in the Double Bar Frame, the long Wheel Base the Vee cu. Engine with stripped cylinders, the Anti-Friction bearings, Valves and names as other so-called new features which we have used for years.

Get the original and Know you're right.

The 1909 models represent a combination of speed power, strength, durability and simplicity never before equalled.

Send for Catalog A and further particulars.

**G. H. CURTISS MFG. CO.**
**HAMMONDSPORT . . . NEW YORK**

# MIDGET BI-CAR

The most comfortable Motorcycle produced. Built like a car. Agents better hear our proposition before closing contracts.

**Walton Motor Co. (Inc.)**
**Lynbrook, Long Island**
**Sole Licensees and Manufacturers**

# The Standard Line of Bicycle and Motorcycle Parts

is invariably chosen by the wise manufacturer. Standard products have for years maintained such unvarying excellence that their use usually marks the high-grade wheel.

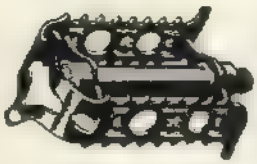
The **Diamond E** Spokes and Nipples are favorites because of their fine quality. "Sunbeam" Spokes are also in great demand, as they make a very attractive wheel, flashing like sunbeams.

In the Pedal line you can safely choose either "Star," "Bridgeport," or "Standard"—all are splendidly made and will give good service.

"Sager" and "Star" Toe Clips are noted for their special finish and workmanship.

They hold the foot securely, yet without a cramping pressure.

May we send you prices and printed matter?



NO. 3 STAR R. T. PEDAL

SABER

**THE STANDARD CO., Torrington, Conn.**

# M-M—KING OF MOTORCYCLES

**Silent and Powerful. Built for Service and Delivers the Goods**

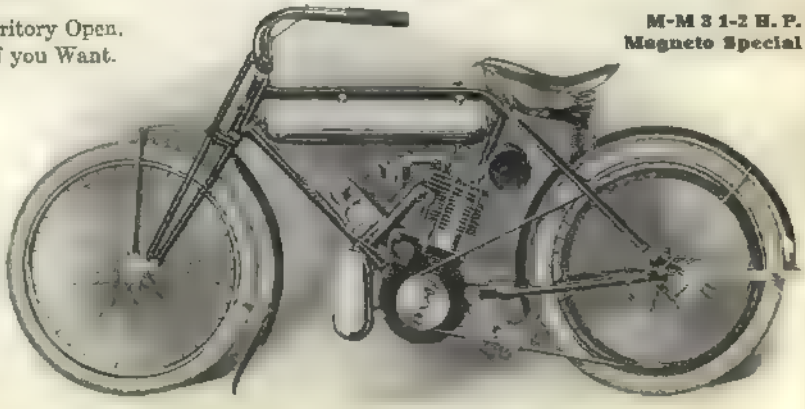
**3 to 7 H. P.**
**Flat or V Belt Drive**

SINGLE CYLINDERS
DOUBLE CYLINDERS
BATTERY IGNITION
MAGNETO IGNITION

**6 Models**
**Roadsters or Racers**

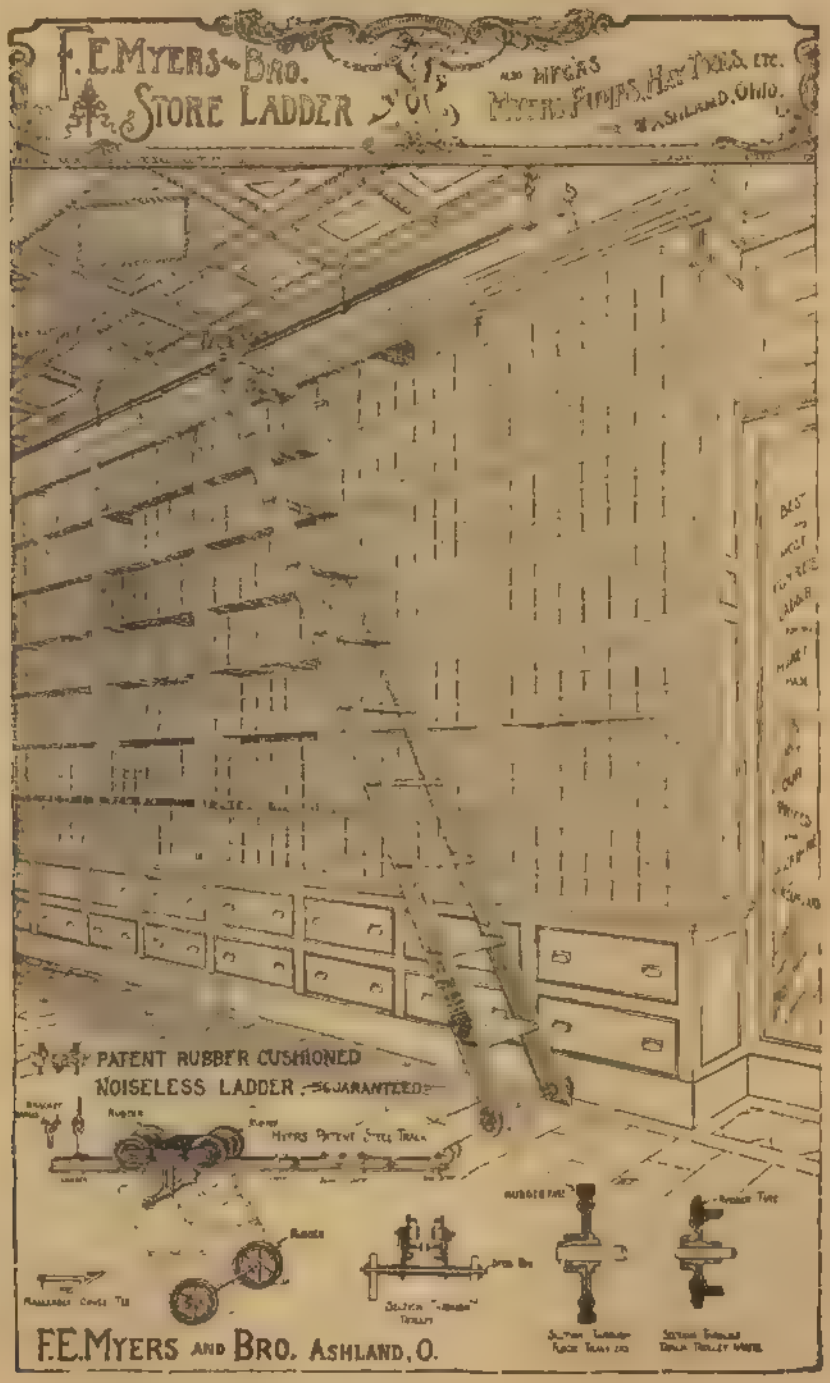
Good Territory Open. Catalog if you Want.

**M-M 3 1-2 H. P. Magneto Special**



American Motor Company
715 Centre Street, Brockton, Mass.

# Myers Cushion Tire Store Ladders




**Directions for Fitting Store Ladders**

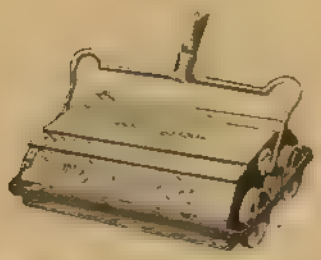
Give us the Exact Height of the Ceiling and the Length of Each Track
If Height of Ceiling varies, give us height at each end and center of each run of Track

| | | |
|---|---|---|
| **Ladder and Trolley Complete** | Each | $20.00 |
| **Track–Complete with Hangers** | Per Foot | .30 |

Prices are F. O. B. Factory Not Carried in Stock

# Carpet Sweepers

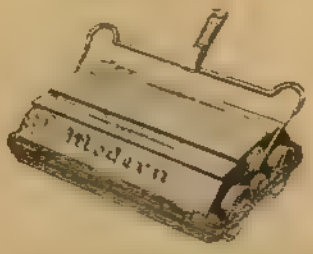
## DOMESTIC



Oak Wood Case, High Varnish Finish, Rubber Tired Wheels, Brass Band around Case, Good Bristle Brush, Automatic Dumping Device

| No. | Per Doz. |
|---|---|
| 1–Domestic–Japanned Trimmings | $40.00 |

## MODERN




Oak and Sycamore Wood Case, Assorted Finishes, Highly Varnished, Rubber Tired Wheels and Band around Case, Good Bristle Brush, Automatic Dumping Device which Dumps Each Pan Separately, a Rubber Band around the Brush Pulley causes a more positive Friction, giving greater Sweeping Power

| No. | Per Doz. |
|---|---|
| 2–Modern–Japan Trimmings | $40.00 |
| 3–Modern–Nickel Trimmings | 44.00 |

## BISSELLS STANDARD

This Sweeper is the original "Grand Rapids" without "Cyco" Bearings and is one of the strongest and most durable of all the Bissell Patterns. It comes in a variety of Fine Woods and Finishes, and contains all the Best Features of the original "Grand Rapids" including a most complete broom action, self-adjusting [illegible], automatic Dump, Reversible Bail Spring

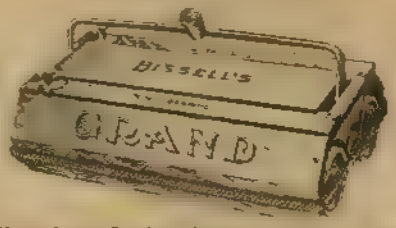
| No. | Per Doz. |
|---|---|
| 4–Standard–Japan Trimmings | $46.00 |
| 5–Standard–Nickel Trimmings | 50.00 |
| Extra Handles | |

## BISSELLS UNIVERSAL

"Cyco" Bearing, a High Grade Sweeper, contains all the latest Patented Improvements, such as Cyco Bearings, Dust Proof Axle Tubes, Anti-Raveling Collector, Etc

| No. | Per Doz. |
|---|---|
| 6–Universal–Japan Trimmings | $50.00 |
| 7–Grand Rapids–Nickel Trimmings | 54.00 |
| 17–Grand Rapids–Nickel Trimmings | 60.00 |

## BISSELLS HOTEL GRAND




For Halls, Churches, Lodge Rooms, Etc., "Cyco" Bearings, Dust Proof Axle Tubes, Anti-Raveler, Etc., Length of Case 17 in., Quarter Sawed Oak, Highly Finished

| No. | Per Doz. |
|---|---|
| 8–Hotel Grand Nickel Trimmings, Ball Bearings | $80.00 |

## SWEEPER EASEL

No. 3

Displays Three Sweepers, Requires a Floor Space of only 20 in. Square, Made of Oak, Furnished Gratis, if requested, with one-half doz. or more Bissell Sweepers

NOTE–Easel will not be sent unless requested.

# The Neverout

TRADE MARK

## Motorcycle Oil Lamp

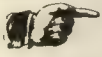
**A Combination of Head Light and Tail Light in One Lamp**

**For 10 years the world's standard**

PATENTED

**Note Double Clamp Brackets and Rear Signal—Prevents Accidents**

The Neverout **Motorcycle Oil Lamp,** by means of its patent glass-covered reflector, throws more light than most gas lamps. It is the only satisfactory motorcycle lamp on the market to-day, and positively will not rattle apart. An examination will show its many novel and exclusive features, which cannot well be stated in an advertisement,—it must be seen and used to be appreciated. The only motor cycle lamp that positively stays lit and will not rattle apart.



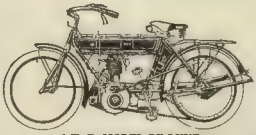
**Jobbers, write for our proposition. Your catalogue not complete without** The Neverout

Write Today

**Rose Manufacturing Co., 911 Arch St., Phila.**

# N. S. U. MOTORCYCLES
## THE WORLD'S BEST

**FOR 1910**



4 H. P. MODEL DE LUXE

The N. S. U. Line will be the most complete and up-to-date Motorcycle line ever offered to the buying public. Our original ideas will be furthered even to a greater extent than heretofore, and the imitators will still be 5 years behind.

**AGENTS**

It would be a wise move to look into our proposition. "DO IT NOW" and write for catalogue "A" today.

**N. S. U. MOTOR COMPANY**
206 W. 76th Street ▫ New York City

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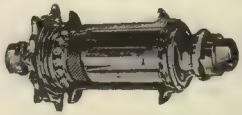
**SIMPLICITY** is a striking feature of the **ECLIPSE COASTER BRAKE**



and it is this simplicity which makes them so safe, as there are no intricate parts to get out of order at critical moments. Be sure to see that the motorcycles you handle this season have the

**Eclipse Coaster Brake**

It is the only one suitable for high-powered machines.

**Eclipse Machine Company, Elmira, New York**

---

THE STAR

**THE STAR BALL RETAINER CO.**
Lancaster, Pa., U.S.A.

Complete Thrust Bearing

Radial Retainers

**Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings, Special Stamping, etc.**

---

# GEER MOTORCYCLES

5-H. P. 2-cylinder GEER ESS $325.00
4-H. P. BLUEBIRD - - - 200.00
2¼-H. P. GEER Model 4 150.00
Used motor-cycles - - - 40.00

We have the largest line of new and used motorcycles in the country at the lowest prices. Every machine guaranteed. Repairs a specialty. Motors and castings for air-ships. Motors for railway velocipedes. Send for catalogue.

HARRY R. GEER CO.
856 McLaran Ave. St. Louis, Mo.

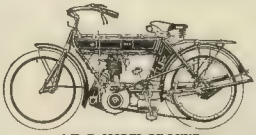
---

# NEW ERA AUTO-CYCLE
TWO SPEEDS, FREE MOTOR, HAND-CRANKED MOTOR

**The New Era Gas Engine Company**
7 Dale Avenue, Dayton, Ohio

# N. S. U. MOTORCYCLES
## THE WORLD'S BEST

**FOR 1910**



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**N. S. U. MOTOR COMPANY**
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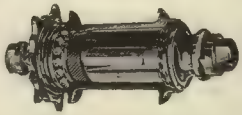

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Complete Thrust Bearing

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2¼-H. P. GEER Model 4 150.00
Used motor-cycles - - - 40.00

We have the largest line of new and used motorcycles in the country at the lowest prices. Every machine guaranteed. Repairs a specialty. Motors and castings for air-ships. Motors for railway velocipedes. Send for catalogue.

HARRY R. GEER CO.
856 McLaran Ave. St. Louis, Mo.

---

# NEW ERA AUTO-CYCLE
TWO SPEEDS, FREE MOTOR, HAND-CRANKED MOTOR

**The New Era Gas Engine Company**
7 Dale Avenue, Dayton, Ohio

# MPORTED AND DOMESTIC FANS

Everything Worth Selling

**We import all our Japanese fans direct** through our own resident buyers, giving us first pick at new styles and insuring lowest costs. We have the best and newest in all grades, a competitionless line of popular priced goods, and as good a one of the better grades. Note that almost without exception our fans come **assorted to the dozen,** giving a large variety at a small outlay. Let us send you a representative order and we think you will find a dollar buys you more fan value than you ever had before.

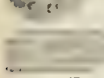
## PALM LEAF FANS—in Cases.

L139 Common, 12 in. Fresh new stock, bright green and perfect. 500 in case, weight 10c. no less sold.. . . . . Case, **$5.50**

L140—Satin, 12 in., extra quality, assd. 4 shapes. 500 in case, weight 25 lbs., no less sold. . . . . Case, **$4.25**

L141—Satin, 15 in., 4 shapes. 500 in case, weight 25 lbs., no less sold. . . . . Case, **$5.25**

## ADVERTISING FANS.



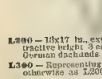
L553—Full bamboo brush, assd. gold and silver border. Much used for advertising purposes. 500 in case, no less sold. Case, **$3.25**

Address, etc. on each spar. . . . . per M 2½

Cost of very plain in advertising printed

## UP TO DATE ADVERTISING FANS.

These should be ordered separately, as there will be a delay of from two to three days in shipping, on account of printing; print your ad very plainly, in order to avoid misspelling. No printed fans can be returned.



L360—10x17 in., extra heavy cardboard, attractive weight. 3 color effects, representing German diamonds and comic scenes.

L360—Representing American Beauty girls, otherwise as L360.

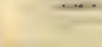
We will print your ad on the back of the above at no extra charge. Send us 50 words, at the following rates:

| | |
|---|---|
| 1 to 100 fans | 50c per 100 |
| 100 to 500 fans | 40c per 100 |
| 500 to 1000 fans | 30c per 100 |
| 1000 to 5000 fans | 25c per 100 |
| 5000 to 10000 fans | 20c per 100 |
| 10000 to 25000 fans | 15c per 100 |
| 25000 to 50000 fans | 12½c per 100 |
| 50000 to 100000 fans | 10c per 100 |

## FANCY JAPANESE FLAT FANS

Landscape decorations, cut out openwork effect, frosted or metallic sprinkled, metal-tip tipped edge, mailed or colored bamboo handles, with loop. 8 doz. in box. 6 styles assd. . . . . Doz. 12c

## JAPANESE BOTTLE FAN.



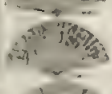
L4418 shape, extend

Doz. 36c

## JAPANESE FOLDING FANS Empire Style.

All narrow folding. Excepting L800 all have cord and tassel.

L800—7½ in., assd. floral and scenic



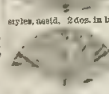
L802 8 in., good quality paper floral decorations, moulde ornament, silver traced

assd. sizes, er decorated outside

L803—8½ in., top edged floral scroll decorations on tinted grounds, silver tipped white sticks, cut traced

L804—8½ in., floral decorations, silver tip edge, colored inside, floral decorated white

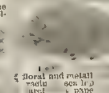
raised silver traced floral garland and scroll designs, silver tip edge, colored sticks tinted in cloud effect. 2 styles, assd. 2 doz. in box. Doz. **30c**



L806 8 in., metallic and tinted grounds assd. floral decorations, tinted and decorated outside and inside sticks. 2 doz. in box, 3 styles. . Doz. **33c**

tation ribbed paper, floral leaf and butterfly designs in silver and delicate tints

ornated carved white sticks, 3 s



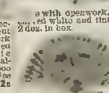
floral and metallic ssd. 1 p ated carved sticks

4½c

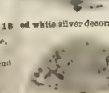
8 strong

scroll d

e with openwork, silver tipped decorated white and tinted sticks, 2 styles, assd. 2 doz. in box. Do

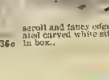


L812—8½ parchment paper, tasteful shaded backgrounds, floral frosted

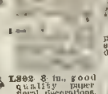


ed white silver decorated sticks. 2 doz.

vert. ment paper, ated

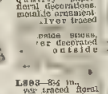


scroll and fancy edge ated carved white stic in box.



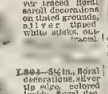
L815 8 in., imitation openwork, silver traced, frosted and sprangled floral cluster and scroll decorations, fancy and silver tipped lacquered sticks decorated silver traced. 2 styles assd. Doz. **78c**

ped edge, carved white and brown

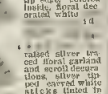


L817 8½ imitation parchment paper, tasteful in

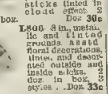
ic spangles, silver traced leaf scroll



embroidered flower silver color brocade decorated carved styles assd.

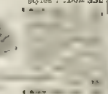


$1.80



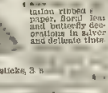
L820 8½ parchment paper pastel tinted grounds, colonial effects, and hand superdecorations, gold and silver traced, metallic sprangled, carved

decorated inside natural and white ivalo tassels, 6 styles, assd. in



L821—8½ in. tinted floral parchment paper openwork silk tasseled, floral assortment decoration, stripe coloring, heavy metallic traced and sprangled, silver traced, carved

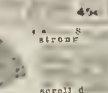
ver tip edge, decorated carved white sticks 6 styles 1 with loop outside sticks. 6 in box, assd.



L822 8½ in. tinted white (1) silver cutwork and veined, white floral decorated silver sprangles, carved

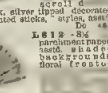
tastefully assorted hand painted si

decorat



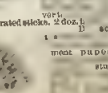
L818—9 in

all ge tipped sons with black gauze edges

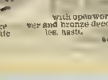


ver traced floral designs ed silver decorated silk tassel 1 doz. box.

## IMPORTED FOLDING SILK FANS.



L830 8½ in., white silk brilliantined edge, tinted floral decorations, traced silver embossed white sticks. doz in box. Doz. $2.25



L831 silk fancy edge

with openwork, ver and bronze decoations, assd.

## JAPANESE FOLDING FANS White.

Sold by box only Each with cord and tassel

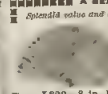
L825—7½ in., cream paper, silver floral and scroll designs with inlaid metallic spots, silver tip edge, white sticks. 2 doz. in box, assd. 2 styles. Doz. **18c**

L826—8½ in. silver and white floral decorations, silver tip edge, white sticks, silver decorated. 2 doz. in box..... Doz. **24c**

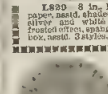
L827—8½ in., imitation silk paper floral decorations in silver and white, silver tracing carved decorated sticks. 2 doz. in box. Doz. **36c**

## A BEAUTY.

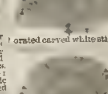
*Splendid value and attractive decoration.*



L829 8 in., lustre parchment paper, assd. shaded and silver floral designs and white floral decorations, frosted effect, sprangled 1 doz. in box, assd. 2 styles. Per dozen. **65c**



L830 8 in., white lustre parchment, shaded, silver and white floral decoration cut out silk gauze work, silver traced and spangled, silver decorated carved white stick



L831—8½ in., imitation white silk paper, silver and metallic traced floral decorations, silver sprangled and tipped decorated carved sticks. 2 styles Doz. **90c**

*Fold fan*

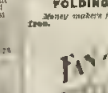
n. Plain or frosted lustre

and leaf decorations, metal

ns spangles and tracing, silver tip edge, fancy carved decorated white sticks. 1 doz. styles. Per Dozen. **$1.50**

## FOLDING FAN ASSTS.

*Money makers for you. Display rack free.*



L870—5½x9½ in. lustre parchment leaf assts. floral ers, metallic

id lustre xcellent 5 cent values

Per box, **$2**

box ...ntity 10 **$3.50**

L863 Assid. sizes 6 to 10 in., lustre parchment, imitation silk and leather assid. floral and landscape decorations assid. some openwork, white, tinted and colored, decorated, plain and carved sticks cord and tassel. Assid. 50 in box, no less sold. Doz. **$3.50**

NOTE—With each assortment we give free a hanging circular display rack as per

# Parker Double Barrel Hammerless Guns

C H. E

| Grade | Each |
|---|---|
| *C. H. –Bernard Steel, Damascus Steel or Acme Steel Barrels, Fine Imported Walnut Stock with Silver Shield, 10, 12, 16, 20 and 28 Gauge | $150.00 |
| *C. H. E–Automatic Ejector, otherwise same as C. H. Grade | 175.00 |

B. H. E

| Grade | Each |
|---|---|
| *B. H. –Damascus or Acme Steel Barrels, Fine Imported Walnut Stock, Gold Shield, Regular or Monte Carlo Stock, Finely Checked and Engraved, Skeleton Butt Plate, 10, 12, 16, 20 and 28 Gauge | $200.00 |
| *B. H. E–Automatic Ejector, otherwise as B. H. Grade | 225 00 |
| *A. H. –Finest Damascus or Acme Steel Barrels, Fine Imported Walnut Stock, Beautifully Engraved and Checked, Gold Shield, Regular or Monte Carlo Stock, 10, 12, 16, 20 and 28 Gauge | 300 00 |
| *A. H. E–Automatic Ejector, otherwise as A. H. Grade | 325 00 |

A. A. H. E

| Grade | Each |
|---|---|
| *A. A. H–Pigeon Gun with Whitworth Fluid Compressed Barrels, Circassian Walnut Stock, Gold Shield, Regular or Monte Carlo Stock, Elaborately Engraved, 12, 16, 20 or 28 Gauge | $400.00 |
| *A. A. H. E–Automatic Ejector, otherwise as A. A. H. Grade | 425.00 |

**For Parts, see Pages 1813 and 1814**

Standard Length Barrels, 10 Gauge, 32 in.; 12 Gauge, 30 in.; 16, 20 and 28 Gauge, 28 in.

*From Factory only

# Parker Double Barrel Hammerless Guns

V. H. E

| Grade | Each |
|---|---|
| *V. H. –Vulcan Steel Barrels, American Walnut Stock, Checked and Engraved, 10, 12, 16, 20 and 28 Gauge | $ 50 00 |
| *V. H. E–Automatic Ejector, otherwise as V. H. Grade | 75 00 |
| *P. H. –English Twist Barrels, Fine American Walnut Stock, Checked and Engraved, 10, 12, 14, 16 and 20 Gauge | 65 00 |
| *P. H. E–Automatic Ejector, otherwise as P. H. Grade | 90 00 |

G H E

| Grade | Each |
|---|---|
| *G. H. –Three Blade Damascus Steel Barrels, Fine Imported Walnut Stock, Checked and Engraved, 10, 12, 14, 16, 20 and 28 Gauge | $ 80 00 |
| *G. H. E–Automatic Ejector, otherwise as G. H. Grade. | 105 00 |

D H E

| | Each |
|---|---|
| *D. H. –Fine Damascus or Titanic Steel Barrel, Imported Walnut Stock, Silver Shield, Fine Checking and Engraving, Skeleton Butt Plate, 10, 12, 16, 20 and 28 Gauge | $100.00 |
| *D. H. E–Automatic Ejector, otherwise as D. H. Grade | 125.00 |

Standard Length Barrels, 12 Gauge, 30 in.; 16 and 20 Gauge, 28 in. For Parts, See Pages 1813 and 1814

*From Factory Only

# Show Window Reflectors

## SILVERED INSIDE, GREEN ENAMELED OUTSIDE

No. 777—Scoop Reflector

The great demand by the merchants for a reflector that will use the **Tungsten Lamp in pendant position.**

**THE SCOOP REFLECTOR** is intended for use with the 100 Watt Tungsten Lamp placed in vertical position, but it can also be used for 40 or 100 Watt Lamps. With 40 Watt Lamps a best distribution of light is obtained.

It is easily attached to the ceiling under any Crowfoot or Canopy used for the purpose. Where Conduit is used, Condulets and Condulet Receptacles are recommended. Where Molding is used we advise Molding Receptacles.

As will be noticed by its shape the vertical side of the Scoop Reflector comes in at a slight angle which cuts the rays of light sharply at the lower window line, preventing the great intensity of the Lamp from glaring where required throughout the window and also giving a brilliant effect at the upper part of the back trim. The reflector being pure silver plated and its shape the light is economically wasted on the top of a window, is instead thrown on the goods displayed.

| No. | Width | Depth | Height | Each |
|---|---|---|---|---|
| **777** | **9 in.** | **9 in.** | **7 in.** | **$3 00** |

Socket and Shade Holder not included in above price.

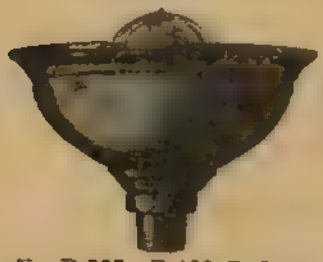
Send for Special Pamphlet giving full data.

# Eye Comfort System of Illuminating

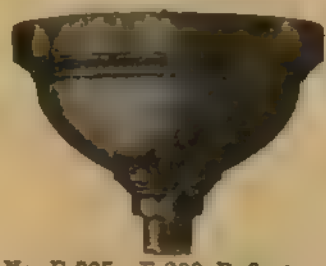
In this system fixtures to support the lamps are used and the lamps and reflectors are pointed up toward the ceiling so that no lamp is visible and the light is first directed to the ceiling at the proper angles. The ceiling should be light in color. The illumination of the room is accomplished by the diffuse reflection from the ceiling. The diffused light reflected from the ceiling evenly distributed throughout the room, gives results that are surprising in efficiency, aesthetic effect and eye comfort.

The ceiling should be light in color but not necessarily white in using this system. As a matter of fact, the majority of ceilings are light enough to be suitably adapted for its use. It is not essential that the walls should be of a light color although light in such cases is desirable, but is less

# Eye Comfort Units



No. E 305—E 100 Reflector



No. E 305—E 200 Reflector

These Units are designed for use on upright Sockets where a number of Units are necessary on a fixture. In many cases Pendant or Angle Arms on Fixtures can be turned up, and these Units used

| No. | Style of Reflector | Finish | Each |
|---|---|---|---|
| E 305 | No. 100 | Old Brass | $ 4.25 |
| E 305 | No. 200 | Old Brass | 4.25 |

The above Units are for use with 60 or 100 Watt Mazda Lamps.

# Eye Comfort Fixtures

No. E 401—E 100 Reflector

No. E 417 E 100 Reflector

| No. | Finish | Each |
|---|---|---|
| E 401—with E 100 Reflector, complete as shown. | Old Brass | $11.00 |
| E 417—with E 100 Reflector, complete as shown. | Old Brass | 20 00 |

Prices do not include lamps.

Bulletins giving full information, furnished on application.

# PLUMBERS' TOOLS

Plumbers Shave Hook
Fig. 871A

No. 318

Plumbers Chipping Knife
Fig. 871B

No. 321

**No. 318,** Shave-Hook, Cast Steel, Oval Blade, Polished, Black Handle, per dozen.....$3.50
**318½,** Shave Hook, Cast Steel, Triangular Blade, Polished, Black Handle, per dozen..... 3 50
**321,** Chipping Knife, Cast Steel, Leather Handle, Assorted Lengths, 4½, 5 and 6 inches, per doz . 6 25

Plumbers Lead Dressers
Fig. 871C

No. 324

Plumbers Tap Borer
Fig. 871D

Plumbers Turn Pin
Fig. 871E

No. 322

## YAGER'S
Soldering Salt

½ lb. bottles, each.....$ 60
1 lb. bottles, each..... 1 00
5 lb. bottles, each..... 5 00
10 lb. bottles, each.....10 00

No. 319

**No. 319,** Tap Borer, Cast Steel, New York Pattern, Extra Heavy Shank, per dozen.....$ 4.00
**322,** Turn Pin, best Boxwood, Assorted, per dozen..... 3.00
**324,** Lead Dresser, best Lignum-vitae, per dozen..... 12.00

Soldering Coppers

Fig. 871F

No. 1, Pointed or Common Pattern

Fig. 871G

No. 3, Flat or Bottoming Pattern

Fig. 871H

No. 4, Roofing Pattern

Fig. 871I

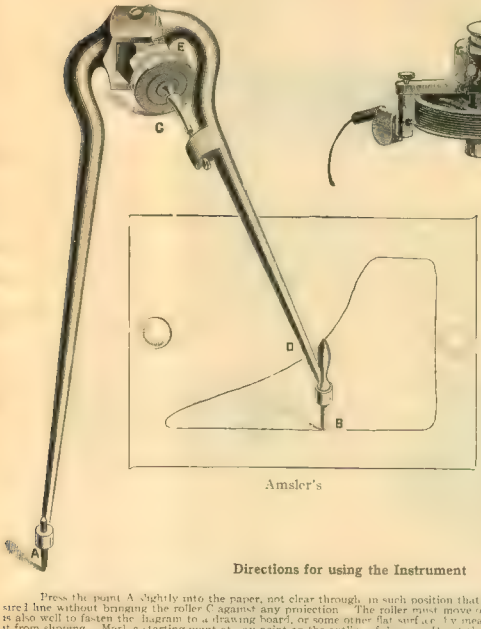
No. 5, Hatchet Pattern

No 5

No. 1, XLCR pounds per pair, 1, 2, 3, 4, 5, 6, 7, 8, 10, per pound ..... $ —
3, XLCR pounds per pair, 2, 3, 4, 5, 6, per pound .....
4, XLCR pounds per pair, 6, 7, 8, 10, per pound.....
5, XLCR pounds per pair, 6, 8, per pound.....

## POLAR PLANIMETERS

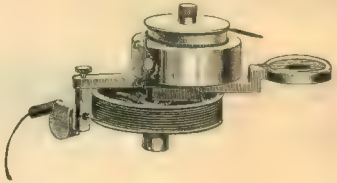
Fig. 143A




Amsler's

## IDEAL REDUCING WHEEL

Fig. 143B



To use the reducing wheel on the indicator, remove the carrier pulley from the indicator and put the wheel on in place of it. Pass the drum cord around the small disk through the hole and under the holder, being careful to see that the cord is wound around the bushing or disk from the left. Before attaching hook, see that cord on the wheel and indicator is taut at shortest part of the stroke, and that it will pull out a little farther than the longest part of the stroke.

The reducing wheel can be used in any place where it is most convenient, bearing in mind that the cord from it to the cross-head should run in a straight line. In unhooking the cord, allow it to return slowly until the stop reaches the guide pulley.

Bushings of various sizes are furnished for small disks, so that cards can be taken from any length of stroke up to 72 inches.

Price, all nickel plated $15.00

### Directions for using the Instrument

Press the point A slightly into the paper, not clear through, in such position that the tracer B will follow the desired line without bringing the roller C against any projection. The roller must move on a continuous flat surface. It is also well to fasten the diagram to a drawing board, or some other flat surface, by means of tacks or springs to prevent it from slipping. Mark a starting point at any point on the outline of diagram D, set the tracer at that point and press zero on the roller so it exactly coincides with the zero on vernier E. Now trace the line, in any one direction, by the hands of a watch, stop at the starting point and take the reading.

First—Find the highest figure on the roller that has passed the zero on the vernier, moving to the left, which we will assume to be 4; now the construction of the instrument is such that each figure on the roller represents an equal number of square inches.

Second—Find the number of completed divisions between 4 on the roller and zero on the vernier, which we will assume to be 5.

Third—Find the number of the mark on the vernier which coincides with some mark on the roller, which in this case may be 6. We now have the exact reading 4.56 or $4\frac{56}{100}$ inches area. In measuring diagrams of more than 10 inches area, add 10 to the result.

If the area to be measured be very large divide it by lines into areas of less than 20 square inches, and take separate measurements. If the drawing be to a scale, multiply the result by the square of the ratio number of the scale. Should we desire to find the area of a plan containing 5 square inches, drawn to a scale of 100 feets to the inch, we square the ratio number and multiply by 5, thus: $100 \times 100 = 10{,}000 \times 5 = 50{,}000$ square feets. In using the planimeter for indicator diagrams, for which it is specially adapted, we find the area of the diagram according to the foregoing directions which we will assume to be 2.48, we now measure the length of the diagram parallel with the atmospheric line, which we will say in this case is 4 inches. Now divide the area by the length the quotient is the mean or average height of the diagram in inches, which is .62 inch. This we multiply by the scale of the indicator which we will assume to be 40, the product gives us 24.8 pounds mean pressure each square inch of the piston.

## COUNTERS

Fig. 144A

| | | | | |
|---|---|---|---|---|
| No. 4 | Counts to 10,000. | Nickeled or Enameled. | Shipping weight, 3½ pounds.. . . . . | $ 8.00 |
| No. 5 | Counts to 100,000. | Nickeled or Enameled. | Shipping weight, 3¾ pounds . . . . . | 10.00 |
| No. 6 | Counts to 1,000,000. | Nickeled or Enameled. | Shipping weight, 4½ pounds.. . . . . | 12 00 |

Number of counter corresponds with number of figures.

## IMPROVED ENGINE REGISTERS

Fig. 144B

Fig 144C

These instruments are for either right or left revolutions and reciprocating motions, and work equally well under varying lengths of stroke or revolving motions.

Unless otherwise ordered, they are driven from the right hand side by a lever, as shown in the cut.

This style register has positive movement, is durable, accurate and reliable.

**Price List**

| Size | | | Brass Case | N. P. Case O. G. or Oct. Ring |
|---|---|---|---|---|
| 12 | inch | 8 wheels | $110.00 | $114.00 |
| 10 | " | 8 " | 95.00 | 98.00 |
| 8½ | " | 8 " | 80.00 | 82.50 |
| 12 | " | 6 " | 100.00 | 104.00 |
| 10 | " | 6 " | 85.00 | 88.00 |
| 8½ | " | 6 " | 70.00 | 72.50 |
| 6¾ | " | 6 " | 60.00 | 62.00 |
| 6 | " | 6 " | 50.00 | 52.00 |

**Price List**

| Size | | | No. of Figures | Plain | Resetting |
|---|---|---|---|---|---|
| 7 | x 2½ inch, | large size | 4 | $20.00 | $24.00 |
| 8 | x 2½ " | " " | 5 | 24 00 | 28 00 |
| 9 | x 2½ " | " " | 6 | 28.00 | 32.00 |
| 10 | x 2½ " | " " | 7 | 32 00 | 36 00 |
| 1¼ | x 1¾ " | small size | 4 | 17 50 | 21 50 |
| 5 | x 1¾ " | " " | 5 | 20.00 | 24.00 |
| 5½ | x 1¾ " | " " | 6 | 24.00 | 28.00 |
| 6 | x 1¾ " | " " | 7 | 28.00 | 32.00 |

# Lanterns

DAISY CANDLE

BOY

POLICE

No. 103 Regular

No. 303 Flash

| | | Per Doz. |
|---|---|---|
| Daisy, Candle | Frames only | $ 2.00 |
| | Chimneys only | 1.50 |

| | Per Doz. |
|---|---|
| Boy–All Brass, No. 0 Convex Burner, ⅛ in. Wick, Boy Globe | $ 3.75 |

Six Doz. in a Case, Weight 50 Lbs.

Regular. Japanned

| No. | Per Doz. |
|---|---|
| 103–3 in. Lense | $ 7 00 |

Flash. Japanned

| No | Per Doz. |
|---|---|
| 303–3 in. Lense, Flash | $ 9.00 |

Two Doz. in a Case

HAMS HOOD REFLECTOR LAMP

Side Spring, with Dash Attachment
No. 1 High Cone Burner, ⅜ in. Wick, No. 0 Globe

| No. | Per Doz. |
|---|---|
| 0–Hood Reflector, Japanned Blue, Plain Globe | $22.00 |

Gross Weight ½ Doz. 40 lbs.

One-half Doz. in a Case

DIETZ BUCKEYE DASH LAMP

Side Lift
No. 1 Burner, ⅝ in. Wick, No. 0 Globe, Japanned Blue

| No. | Per Doz. |
|---|---|
| 0–Buckeye Dash, Plain Globe | $13.00 |
| 0–Buckeye Dash, Bulls Eye Lense | 13 50 |

Gross Weight Doz. 52 lbs.

One-half Doz. in a Case

# Lanterns and Lamps

## DIETZ BLIZZARD DASH LANTERNS

Cold Blast, Side Lift
No 2 Burner, 1 in Wick No. 0 Globe

| No. | | Per Doz. |
|---|---|---|
| 2 | Blizzard Dash Lantern, Japanned Blue, Bulls Eye Lense | $17.50 |

Gross Weight ½ Doz. 40 lbs.
One-half Doz. in a Box

## DIAMOND DRIVING LAMPS

Steel, Enameled Black
Interior highly finished with Silver Nickel, Silver Plated Double Convex Lens in door, which greatly magnifies the Light.

| | Per Doz. |
|---|---|
| Diamond Driving Lamp | $42.00 |

Gross Weight ½ Doz. 41 lbs.
One-half Doz. in a Box

## DIETZ TUBULAR STREET LAMPS

Japanned
No. 3 Burner, 1½ in. Wick, No. 3 Globe

| No. | | Each |
|---|---|---|
| 3 S– | | $ 6.00 |

Gross Weight each 26 lbs.
One in a Case

## DIETZ TUBULAR HANGING LAMPS

Japanned
No. 3 Burner, 1½ in. Wick, No. 3 Globe

| No. | | Each |
|---|---|---|
| 3 H– | | $ 6.00 |

Gross Weight each 25 lbs.
One in a Case

# Lamps

### DIETZ TUBULAR SQUARE

Japanned Blue

Height 21¼ in. Width 9⅝ in. Depth 10⅛ in. No. 3 Burner, 1⅛ in. Wick, 8 in. Silvered Glass Reflector

| No. | Each |
|---|---|
| 2– | 6 50 |

Gross Weight 21 lbs.
One in a Case

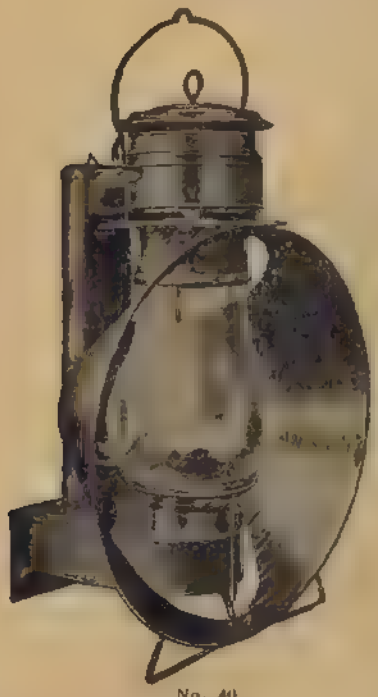
### SQUARE STATION

Japanned Blue

| No. | Each |
|---|---|
| 1–8x10 in. No. 1 Burner, ⅝ in. Wick, 7 in. Glass Reflector, Gross Wt. 12 lbs. | $4.00 |
| 2–10x12 in. No. 2 Burner, 1 in. Wick, 8 in. Glass Reflector, Gross Wt. 16 lbs. | 4.50 |
| 3–11x15½ in. No. 2 Burner, 1 in. Wick, 10 in. Glass Reflector, Gross Wt. 22 lbs. | 5.50 |

One Each in a Case

# Tubular Searchlights

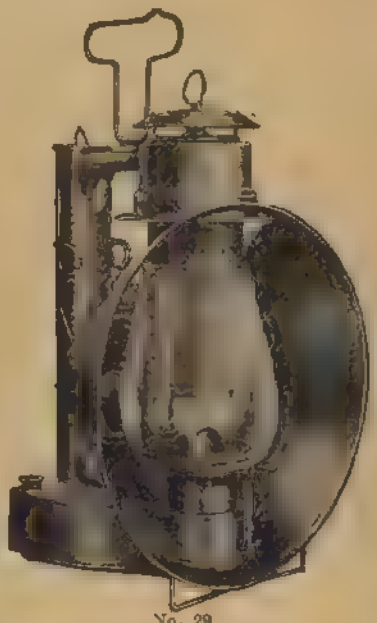


No. 40

Blue Japanned, No. 3 Burner, 1¼ in. Wick, No. 2 Globe, Cold Blast, 8½ in. Deep, 16 in. Brt. Tin Reflector.

| No. | Per Doz. | Each |
|---|---|---|
| 40– | | $6.00 |

Gross Wt. each 25 lbs.
One in a Case



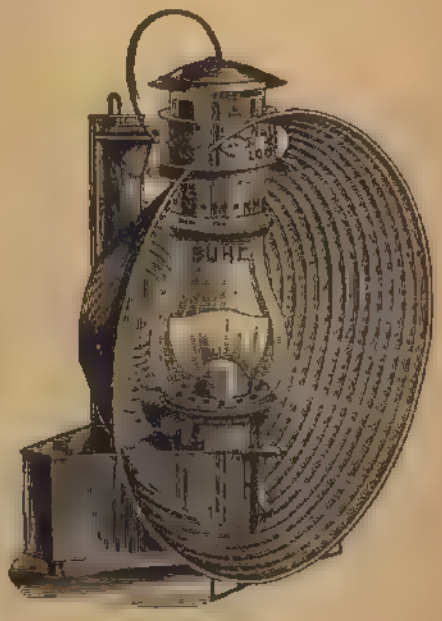
No. 29

Blue Japanned, No. 2 Burner, 1 in. Wick, No. 0 Bulls Eye Globe, 12 in. Brt. Tin Reflector.

| No. | Per Doz. |
|---|---|
| 20– | $30.00 |

Gross Wt. Doz. 96 lbs.
One-half Doz. in a Case

# Buhl Headlight



No. 100

Brown Japanned, No. 2 Burner, 1 in. Wick, No. 0 Globe, 16 in. Reflector.

| No. | Per Doz. |
|---|---|
| 100– | $33.00 |

Gross Wt. each 12 lbs.
One in a Case

# Mill Lamps

Nos. 1 to 8

No. 4

Nos. 9 and 10

**BACK REFLECTOR**

| No. | Each |
|---|---|
| 1–Size Glass, 6x10 in., ⅝ in. Wick, Wt. 3½ lbs | $ 2 00 |
| 2–Size Glass, 8x12 in., 1 in. Wick, Wt. 5 lbs | 2 75 |
| 7–Size Glass, 10x14 in., 1⅛ in. Wick, Wt. 8½ lbs | 3.50 |
| 8–Size Glass, 12x16 in., 1⅛ in. Wick, Wt. 12½ lbs | 4 75 |

**CENTRAL REFLECTOR**

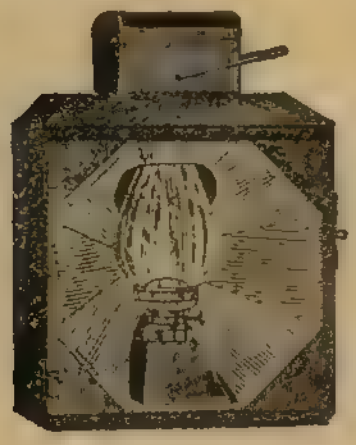
| No. | Each |
|---|---|
| 4–Size Glass, 11x11 in., 1⅛ in. Wick, Wt. 9 lbs | $ 6.00 |

**TRIANGULAR SIDE**

| No. | Each |
|---|---|
| 9–Size Glass, 10x12 in., 1 in. Wick, Wt. 5 lbs | $ 2.75 |
| 10–Size Glass, 12x16 in., 1⅛ in. Wick, Wt. 8½ lbs | 4.00 |

# Headlights

**OCTAGON**



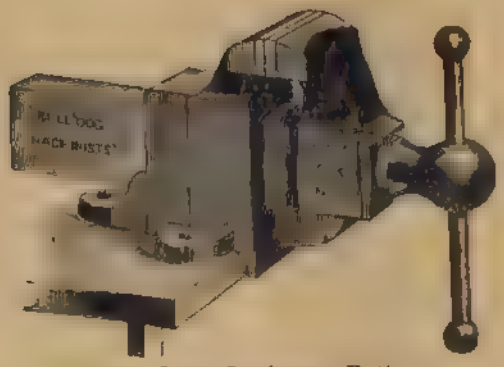
| No. | Each |
|---|---|
| 5–Front Width 12 in. | $ 6.00 |
| 6–Front Width 16 in. | 11.25 |

**LOCOMOTIVE**

| No. | Each |
|---|---|
| 145–14½ in. Lense | $33.00 |
| 170–17 in. Lense | 40.00 |
| 205–20½ in. Lense | 50.00 |
| 240–24 in. Lense | 65.00 |

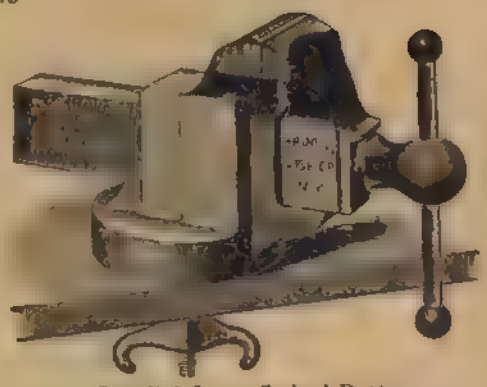
# Prentiss Bench Vises

**Solid Steel Faced Jaws**



**Parallel Jaws Stationary Bottom**

| No. | Jaws | Opens | Weight | Each |
|---|---|---|---|---|
| 51 | 3½ | in. 5¼ | in. 28 lbs | $7 00 |
| 52 | 4 ⅛ | in. 6 | in 42 lbs | 8 50 |
| 53 | 4⅝ | in. 7 | in 52 lbs | 10 00 |
| 54 | 5 | in. 8 | in 72 lbs | 13 00 |



**Parallel Jaws Swivel Bottom**

| No. | Jaws | Opens | Weight | Each |
|---|---|---|---|---|
| 90 | 3¼ | in. 4 | in. 28 lbs | $7.50 |
| 91 | 3⅝ | in. 5⅛ | in. 36 lbs | 8.75 |
| 92 | 4⅛ | in. 6 | in. 52 lbs | 10.50 |
| 93 | 4⅝ | in. 7 | in. 64 lbs | 12.50 |
| 94 | 5 | in. 8 | in. 85 lbs | 16.00 |
| 96 | 6 | in. 10 | in. 155 lbs | 30.00 |

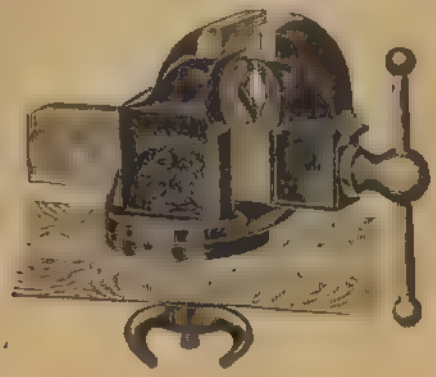
**Swivel Jaw. Stationary Bottom**

| No. | Jaws | Opens | Weight | Each |
|---|---|---|---|---|
| 3 | 4½ | in. 6 | in. 54 lbs | $10 50 |
| 4 | 5¼ | in. 8 | in. 96 lbs | 17 00 |
| 5 | 6 | in. 9 | in. 146 lbs | 21 00 |

**Swivel Jaw. Swivel Bottom**

| No. | Jaws | Opens | Weight | Each |
|---|---|---|---|---|
| 19 | 3½ | in. 4¼ | in. 32 lbs | $ 8 50 |
| 20 | 4⅛ | in. 6 | in. 65 lbs | 12 50 |
| 21 | 5¼ | in. 8 | in. 109 lbs | 19.00 |
| 22 | 6 | in. 9 | in. 168 lbs | 27.00 |

# "Monarch" Combination Pipe



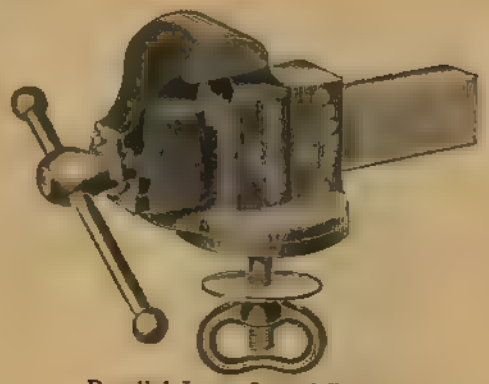
| No. | Takes Pipe | Jaws | Weight | Each |
|---|---|---|---|---|
| 401 | ⅛ to 2½ | in. 3½ | in. 44 lbs | $16.00 |
| 402 | ⅛ to 3 | in. 4½ | in. 65 lbs | 20 00 |
| 403 | ⅛ to 4 | in. 5 | in. 110 lbs | 28 00 |

# Parkers Vises

## BENCH

Parallel Jaws, Stationary Bottom
Solid Steel Faced Round Jaws

| No. | Jaws | Opens | Wt. Ea. | Each |
|---|---|---|---|---|
| B–3⅝ | in. | 5 in. | 31 lbs. | $ 7.00 |
| C–4⅛ | in. | 5½ in. | 48 lbs. | 8.50 |
| D–4⅝ | in. | 6½ in. | 62 lbs. | 10.00 |
| E–5 | in. | 8 in. | 75 lbs. | 13.00 |
| F–5½ | in. | 9 in. | 105 lbs. | 18.50 |



Parallel Jaws, Swivel Bottom
Solid Steel Faced Round Jaws

| No. | Jaws | Opens | Wt. Ea. | Each |
|---|---|---|---|---|
| AA–3¼ | in. | 5½ in. | 28 lbs. | $ 7.50 |
| BB–3⅝ | in. | 5 in. | 37 lbs. | 8.75 |
| CC–4⅛ | in. | 5½ in. | 53 lbs. | 10 50 |
| DD–4⅝ | in. | 6½ in. | 68 lbs. | 12 50 |
| EE–5 | in. | 8 in. | 86 lbs. | 16.00 |
| FF–5½ | in. | 9 in. | 119 lbs. | 22 00 |
| GG–6 | in. | 9 in. | 156 lbs. | 30 00 |

## COACHMAKERS

Parallel Jaws, Stationary Bottom

| No. | Jaws | Opens | Wt. Ea. | Each |
|---|---|---|---|---|
| 4000– | 4 in. | 8 in. | 37 lbs. | $10.00 |

Parallel Jaws, Swivel Bottom

| No. | Jaws | Opens | Wt. Ea. | Each |
|---|---|---|---|---|
| 4600– | 4 in. | 8 in. | 43 | $12.50 |

## COMBINATION PIPE

Swivel Bottom

| No. | Jaws | Holds Pipe | Wt. Ea. | Each |
|---|---|---|---|---|
| 87–3⅝ | in. | up to 2 in. | 41 lb. | $16.00 |
| 88–4⅛ | in. | up to 3 in. | 59 lbs. | 20.00 |

Stationary Bottom

| No. | Jaws | Holds Pipe | Wt. Ea. | Each |
|---|---|---|---|---|
| 88½–4¾ | in. | up to 4 in. | 94 lbs. | $28 00 |
| 89½–5⅜ | in. | up to 6 in. | 141 lbs. | 35.00 |

*THE MARK OF QUALITY*

In the F. A. M.
Endurance Contest, Cleveland
to Indianapolis, Aug. 10th and 11th

# 9 R-S FINISHED

## 4 GOLD MEDALS (perfect scores)
## 5 SILVER MEDALS

¶ Again demonstrating **R-S durability** and **superiority.** All of these machines were single cylinder models and with one exception all of them were equipped with 3 H. P. motors, **the smallest single cylinder R-S motor made.** making the performance a truly remarkable one, especially when compared with the competing high-powered single and twin cylinder machines ridden by experts. Most of the R-S riders were novices.

¶ With but one exception the **number of R-S machines which finished was larger than that of any other make.**

¶ The R-S mechanically operated Intake Valve motor stands unsurpassed —get acquainted with the R-S family—single cylinder, 3 and 4 H. P. Twin cylinders, 6 and 7 H. P.

*Write for Catalogue and Ride an R-S*

## READING STANDARD CO.

**Dept. C, READING, PA.**

# "RADIUM" GASOLINE LIGHTING SYSTEMS

LAMPS AND FIXTURES

## MORE AND BETTER LIGHT FOR LESS MONEY.

A Five Light System in Operation.

**Absolutely the most efficient and economical gasoline light systems on the market for stores, house and public buildings. Look 2 years for Butler Brothers to select what they considered the best gasoline system, being manufactured and an army of satisfied users has commended our choice.**

We guarantee all "Radium" lighting systems to be mechanically perfect and they are shipped ready to hang. As a light system can be made ready for operation within 2 hours after receipt of the goods. The life of the system is indeterminable, as there is no wear on any of the parts, and the only things that have to be replaced are glassware and mantles.

Our prices are so low you will compare most favorably with anybody who handles a line of mixed wares and dishonest.

The "Radium" system is not a central generator system. The liquid gasoline is forced by air pressure into the tank through the hollow wire to the burners and there is vaporized and consumed.

System operates as follows. The tank is divided into 2 parts, over-flow section, and the other for air.

Upon pressure of about 20 lbs. being applied to the air valve, the gasoline is forced through the hollow wire to the lamps. The generators or burners are heated by means of an alcohol torch, which burns about 5 minutes, when the burners are thoroughly heated, the shut-off valve is opened and liquid gasoline is vaporized and the lamp can be lighted at the top of the mantle. The heat generated by the burning gasoline is sufficient to keep the burner hot and vaporize more liquid gasoline coming through the tubing, the action being automatic.

1 gallon of gasoline will run 1 light 25 hrs. A 5 gallon tank will run 1 light 125 hours, or 5 lights 25 hrs. 1 Light will light a space 50x50 ft. for all practical uses.

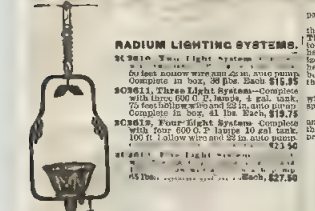
A Radium lighting system burner gives 600 candle power and is the cheapest method of lighting yet devised. Below we give the comparative cost of lighting per hr. based on the following prices:

| | Price | Consumption |
|---|---|---|
| Gas | $ per 1000 c. ft. | |
| Electricity | 1c | per K. W. |
| Kerosene | 12c | per gal. |
| Gasoline | 15c | per gal. |

| | Consumption Cost per hour |
|---|---|
| 20-16 C. P. Electric Lamps | $0 05 |
| 6-60 C. P. Welsbach Burners | 03 |
| Kerosene, cheapest method | 02 |
| Radium System | 00½ |

The best comparison for ourselves and for our customers is to see a system in operation in their own stores. Sufficient directions with each system to make the installing and operating of a system a very easy matter, even for a novice.

The engine of wire supplied with all stock systems are adjustable in almost any case. However for buildings where the ceiling is unusually high, or where a special system is necessary, simply send us a diagram, giving the distances between the lights and connections. These systems are made up at our factory immediately or shortly after the receipt of the diagram.

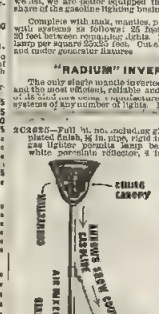


With our new inverted lamp and with the special chandeliers we list, we are better equipped than ever to take care of our share of the gasoline lighting business of the country.

Complete with tank, mantles, lamp, wrench, etc. Wire with systems as follows: 25 feet from tank to first light, and 20 feet between remaining lights. For effective lighting use one lamp per square 50x50 feet. Outshows tank and over generator and under generator figures.

### "RADIUM" INVERTED LAMPS.

The only single mantle inverted gasoline lamp on the market and the most efficient, reliable and look pleasing store fixture of its kind now using. Equipped with 2 mantles, 1 extra mantle in case any one breaks. Send in single lamps or in systems of any number of lights. Included in the list of prices no




**NOTICE.**

Write for our new special catalogue of gasoline lighting devices, which includes several new fixtures, street lamps, student lamps, etc. Also various styles of mantles and glassware. A handy book to have on your desk.

### RADIUM LIGHTING SYSTEMS.

**2C3610. Two Light System**—Complete with two 600 C. P. lamps, 4 gal. tank, 50 feet hollow wire and 22 in. auto pump. Complete in box, 36 lbs. Each $15.95

**2C3611. Three Light System**—Complete with three 600 C. P. lamps, 4 gal. tank, 75 feet hollow wire and 22 in. auto pump. Complete in box, 41 lbs. Each, $19.75

**2C3615. Four-Light System**—Complete with four 600 C. P. lamps 10 gal. tank, 100 ft. hollow wire and 22 in. auto pump. $23 50

**2C3616. Five Light System**—Complete with five 600 C. P. lamps, 10 gal. tank, 125 ft. hollow wire and 22 in. auto pump. 45 lbs. ..... Each, $27.50

### OVERHEAD GENERATOR SYSTEM.

Added to our well known Radium, no for those who prefer the style of lamp. Covered by our guarantee. Material and workmanship the best possible.

**2C3615, Two Light**—Overhead Generator. Equipped as 2C3614. ..... Each, $16.25

**2C3616, Three Light**—Overhead Generator. Equipped as 2C3615 ..... Each, $20.25

**2C3617, Four Light**—Overhead Generator. Equipped as 2C3616 ..... Each, $24.00

**2C3618, Five Light Overhead Generator System**—Equipped as 2C3617 ..... Doz. $28.00

### SUPPLIES FOR RADIUM SYSTEM.

NOTE—To customers who desire to increase the size of their systems, we can furnish the following supplies:

**2C3620**—Single lamp, under

Each $3.75

**2C3632**—Single auge (overhead) with 20 ft. wire. Complete $3.85
**2C1035 Four Gal. Tanks** ..... $7.00
**2C1036 Ten Gal. Tanks** ..... 8.75
Hollow wire ..... 4c
40 lbs. Tension ..... Each 10c
**2C1038—Straight Connections** ..... 15c
**2C1165—Globes** Overhead. Genuine Schott & Jen. Jena, doz. in pkg. ..... Doz $2.25
**Rubber Hose for Pumps**—Wire ..... 7c

### Overhead Generator Supplies.

**2C1039—Shut-Off Valves** ..... Each 35c
**2C1040 Generator Tubes** ..... 35c
**2C1041 Feed Pipe** ..... 10c
**2C1042 Asbestos Wicks** ..... Doz 20c
**2C1043—Galleries** ..... Each 20c
**2C1044—Torches** ..... 5c

### Under Generator Supplies.

**2C1045 Burners** ..... Each 20c
**2C1046—Galleries** ..... 20c
**2C1047 Gas Tips.** ..... 7c
**2C1048—Torches** ..... 5c
**2C1049—Filler Tubes.** ..... 10c

**2C1050 Burner Screen for Radium Under Generator Systems**—Made of wire, brass socket in center to

30c

**2C1027 Burner Screen for standard Generator System**—Brass shell with german silver cases, equipped to use mammoth asbestos

10c

**2C1028, Radium Pump**—The best pump for the price for any use. ..... length of barrel 22 in. Complete with 3 ft. of

one pump we recommend to use in connection with the Radium Systems ..... Each $1.20

### GLOBE FOR GASOLINE PRESSURE SYSTEM.

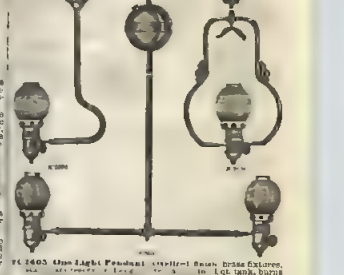
**2C1029**—Mogbeth's No. 633, made of best opalescent glass, does not sag off like light like the cheap

fits opening in top and bottom 3 in. One he could on our overhead "Radium" system, by purchasing the gallery which is made for this globe. Inclosed in

$3.25
Globe glass only ..... 2.25
Price of gallery. See

### "RADIUM" INCANDESCENT GASOLINE GAS LAMPS.

The up to date gasoline stand lamps, more light for less cost than any gravity gasoline lamp made. Made of brass, oxidized finish, fitted with special burners using air-hole glassware which increases your light 100 per cent, giving you a 100 candle power light for each burner. Permitted by the National Board of Fire Insurance Underwriters. Each lamp complete with mantle air hole globe torch, wrench, etc. 1 in box.



**2C 2403 One Light Pendant**—Oxidized finish, brass fixtures, ... to 1 qt. tank, burns ... hrs. without refilling. Complete ... 10 lbs. Each, $2.25

**2C2606, Fancy Harp Lamp**—Oxidized finish, brass. Length 27 in., 1 qt. tank, burns 12 hrs. without refilling. Complete in box. 11 lbs. ..... Each $3.00

**2C2607, Two Light Pendant**—Oxidized finish, brass. Length over all 33 in., 2 qt. tank, burns 12 hrs. without refilling. Complete, 15 lbs ..... Each $3.85

### "RADIUM" LAMPS With Wide Chimneys and Gas Shades.

A trifle more fancy in appearance and perhaps more admirable for house lighting purposes.

**2C3690, One Light Pendant**—Oxidized finish, brass fixtures, stationary reservoir. Length over all 37 in., 1 qt. tank, burns 10 to 12 hrs. without refilling. Complete in box, 10 lbs. Each, $2.60

**2C2691, Plain Harp Lamp**—All brass, polished brass finish. Length over all 27 in., 1 qt. tank. For home, church or hall. Complete with chimney, mantle and shade. Each $3.25

**2C2693, Two Light Pendant**—Oxidized finish brass. Length over all 36 in., 2 qt. tank, burns 15 hrs. without refilling. Complete, 14 lbs ..... Each $4.25

# Ticket Punches

Full Nickel Plated, Assorted Fancy Designs
Length 4¼ in., Reach ¾ in.

| No. | Per Doz. |
|---|---|
| 111 | $ 8.00 |

One-half Doz. in a Box

Full Nickel Plated, Assorted Fancy Designs
Length 6½ in., Reach 2 in.

| No. | Per Doz. |
|---|---|
| 2570 | $21.00 |

Full Nickel Plated, Assorted Fancy Designs
Length 5 in., Reach 1 in.

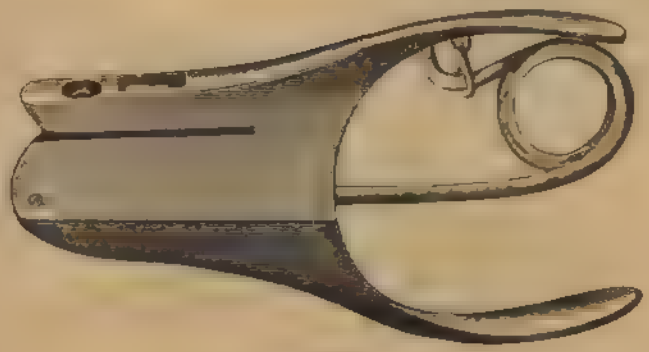
| No. | Per Doz. |
|---|---|
| 250 | $ 4 50 |

One-half Doz. in a Box

Full Nickel Plated, Assorted Fancy Designs
Length 4 in., Reach 1 in.

| No. | Per Doz. |
|---|---|
| 2591 | $16 00 |

# Conductors Punches

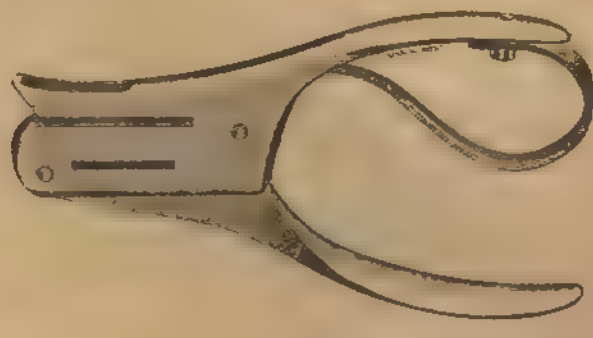


**McGills**

Full Polished and Nickel Plated, Assorted Fancy Designs
Length 4½ in., Reach 1 in.

| No. | Per Doz. |
|---|---|
| 3 | $36.00 |

One twelfth Doz in a Box



**Woodmans**

Full Polished and Nickel Plated, Assorted Fancy Designs
Length 4 in., Reach ¾ in.

| No. | Per Doz. |
|---|---|
| 2 | $60.00 |

# Spring Punches

**Clean Cut**

Extra Quality, Full Polished, Straw Colored Tubes. Each punch is carefully tested before leaving factory, and is Fully Warranted

| No. | Per Doz. |
|---|---|
| 101 | $ 8 00 |
| Extra Tubes | 2 00 |

One-half Doz. in a Wooden Box

**Riverside**

Cast Steel, Polished, Blued Tubes

| No. | Per Doz. |
|---|---|
| 21 | $ 6.00 |
| Extra Tubes | 1.50 |

One-half Doz. in a Box

# Revolving Spring Punches

**Clean Cut**

Extra Quality, Full Polished, Straw Colored Tubes Each punch is carefully tested before leaving factory, and is Fully Warranted

| No. | Per Doz. |
|---|---|
| 104–Four Tubes | $12.00 |
| 106–Six Tubes | 16.00 |
| Extra Tubes | 2 00 |

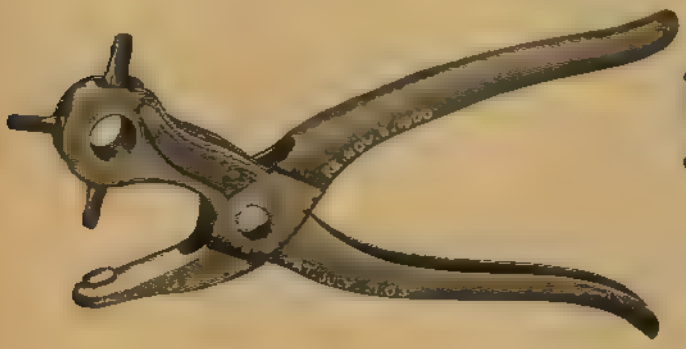
One-half Doz. in a Wooden Box

**Riverside**

Cast Steel, Polished, Blued Tubes

| No. | Per Doz. |
|---|---|
| 24–Four Tubes | $ 9.00 |
| 26–Six Tubes | 12.00 |
| Extra Tubes | 1.50 |

One-half Doz. in a Box

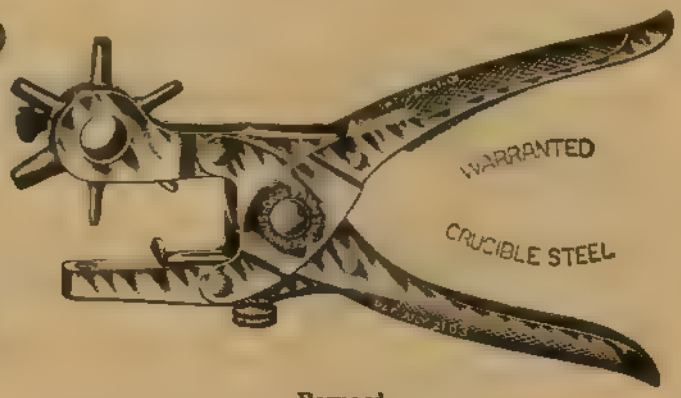


**Lodi**

All Steel, Bright Finish

| No. | Per Doz. |
|---|---|
| 384 Four Tubes | $ 9.00 |
| Extra Tubes | 1.50 |

One-half Doz. in a Box




**Bernard**

Open Throat, Parallel Jaws, Full Nickel Plated. Tubes Screwed to the Hub

| No. | Per Doz. |
|---|---|
| 186–Six Tubes | $36.00 |
| Extra Tubes | 4.00 |

One-twelfth Doz. in a Box

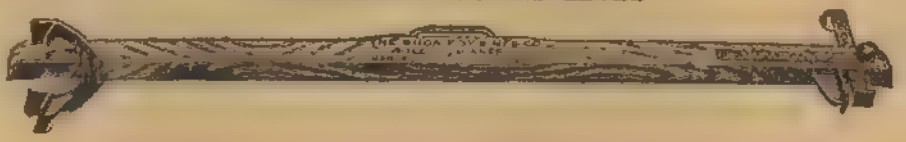
# Railroad Tools

## TRACK LEVEL

White Pine with three coats of Paint, Steel Bound

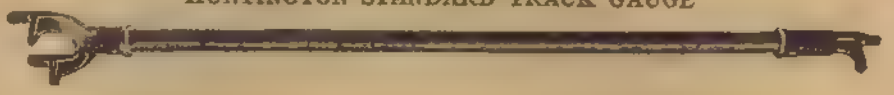
| No. | | Each |
|---|---|---|
| 40 | Track Level | $ 4.50 |

## COMBINED GAUGE AND LEVEL



| No. | | Each |
|---|---|---|
| 50 | Combined Gauge and Level | $ 7.00 |

## HUNTINGTON STANDARD TRACK GAUGE



| No. | | Each |
|---|---|---|
| 60 | Huntington Track Gauge | $ 3.50 |

## TRACK TONGS

Solid Cast Steel

| | Each |
|---|---|
| Track Tongs | $ 5.00 |

## TRACK CHISELS

| | Per Pound |
|---|---|
| Verona—Extra Quality Cast Steel | $ 0.50 |
| Atha —Solid Cast Steel | .40 |

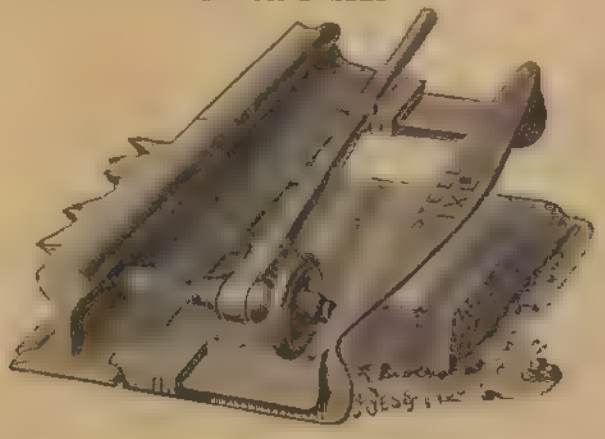
Weight about 4 ½ Pounds each

## JIM CROWS

Screw Rail Benders

| No | For steel rails | Each |
|---|---|---|
| 00 | 16 lbs. weight per yard | $24.00 |
| 0-20 | " " " " | 30.00 |
| 1-25 | " " " " | 36.00 |
| 2-50 | " " " " | 48.00 |
| 3 | 68 " " " | 72.00 |

## TRACK DRILLS



Steel frame, strong, light and easily adjusted. Drills the holes without drawing the spikes. The ratchet can be used wherever a ratchet is needed.

| No. | Each |
|---|---|
| I X L | $24.00 |
| Extra Drill Bits | 1.00 |

# Mattocks

**Clean Cut**
Painted Black, With Polished Crucible Steel Cutters, Fully Warranted

| No. | Weight | Per Doz. |
|---|---|---|
| 10–Long Cutter. | 6 lbs. | $18.00 |
| 20–Short Cutter. | 5½ lbs. | 17.00 |

**Riverside**
Painted Black
Polished Cast Steel Cutters

| No. | Weight | Per Doz. |
|---|---|---|
| 100–Long Cutter. | 5 lbs | $16.00 |
| 120–Short Cutter. | 5 lbs | 16.00 |

**Hunts**
Cast Steel, Painted Black, Polished Cutters

| No | Weight | Per Doz. |
|---|---|---|
| 50–Long Cutter | 5½ lbs. | $18.50 |

| No. | Weight | Per Doz. |
|---|---|---|
| 60–Short Cutter | 5 lbs | $18.50 |

# Pick Mattocks

**Hunts**
Cast Steel, Painted Black

| No. | Weight | Per Doz. |
|---|---|---|
| 70 | 5½ lbs. | $18.50 |

**Riverside**
Extra Cast Steel, Painted Black

| No. | Weight | Per Doz. |
|---|---|---|
| 140 | 5 lbs. | $16.00 |

# Grub Hoes

**Riverside**
Adze Eye, Extra Cast Steel, Painted Black

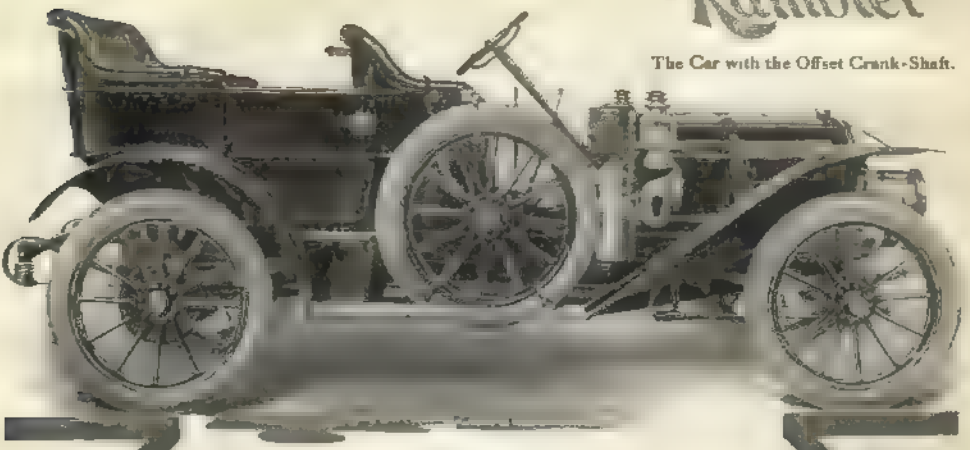
| No. | Weight | Per Doz. |
|---|---|---|
| 1- | 3¼ lbs | $13.00 |

| No. | Weight | Per Doz. |
|---|---|---|
| 2- | 4 lbs | $13.50 |

All on this Page Two Doz. in a Case.

Rambler

The Car with the Offset Crank-Shaft.



Model Forty-four, 34 H. P., $2,250.

Spare Wheel, with Inflated Tire, Brackets, and Tools, $74. Magneto, $150.

# The Rambler Spare Wheel

Have you ever had to stop on the road to repair a punctured tire when you were in a hurry to reach your destination?

All 1909 four-cylinder Ramblers are fitted for the Rambler Spare Wheel—a wheel complete, excepting hub center, with an inflated tire. Can be substituted for front or rear wheels within three minutes' time. Only six nuts to remove—done quickly with special tools provided.

Completely obviates all tire worries; makes punctures mere incidents of a trip and saves the tiresome task of pumping up the new tire. The price of a Rambler Spare Wheel complete is $74 or $85, according to tire size.

Write for catalog describing in detail Rambler Offset Crank-Shaft, Straight-Line Drive, and other exclusive Rambler features

Seven passenger model 45 horsepower, $2 500. Other models, $1,150 to $2,500.

## Thomas B. Jeffery & Company

**Main Office and Factory, Kenosha, Wis.**

*Branches and Distributing Agencies*

Chicago Milwaukee Cleveland Boston New York
San Francisco. Representatives in all leading cities

THE CAR OF STEADY SERVICE

# HERRESHOFF

## THE CAR YOU HAVE WAITED FOR IS HERE

WHEN we planned to introduce the light car of class to do the work that larger, heavier cars were ill suited to do, we believed there would be a demand for a car that was bred of the same stock as the best foreign and American cars, but cast in lighter mold. We were not aware of the extent of that demand. We could place our entire output to-day either in the East, the West or the Middle West. The necessity of distributing it all over the country limits the supply in each district.

In the East and in the West there was need of a car that was smaller than the big, high powered cars, because the cost of maintenance of the big car for ordinary service is out of proportion to the character of that service. The light car, more facile in handling, more economical in up-keep, is the logical car for city and suburban work. Moreover for the man who does limited touring it can do all that the big car can do.

It is no longer necessary to get a big costly car to obtain a car of class. No car at any price is better designed, better constructed of better material or better finished than this

## The Herreshoff Car

THE first appeal of the motor car is its appearance. There are accepted standards; the Herreshoff Car conforms to them. In those things so necessary to the owner of the high-grade car, no car at any price surpasses it. We invite comparison.

Its facile handling and easy riding cannot be described, but we are ready to demonstrate them. Easy riding is a question of correct suspension. The semi-elliptic springs shackled at either end, together with tie rods running from the torque tube to the hubs of either rear wheel, afford the ideal construction for easy riding.

Its power is sufficient either to drive the car from 45 to 50 miles an hour or to climb any hill anywhere. True power is power delivered to the rear wheels. The Herreshoff delivers 24 horse power, one horse power for every 66 pounds of weight in the car; more horse power in proportion to its size than any other engine in the world.

It has been said that an engine of this size could not develop this power. It is doing it, however, because the component parts of the motor are correctly interrelated and because the unit power plant and the straight horizontal drive reduce friction to a minimum.

Light weight prolongs the life of tires. We have larger tires in proportion to the weight than any other car. Light weight also means economical running expense. We get 18 miles to the gallon of gasolene. Oil consumption is proportionately small.

In conclusion we can only say that tho' we made broad claims for the car, it more than realizes our every expectation. We invite your inspection of it and request the opportunity to demonstrate it.

**Manufactured by the HERRESHOFF MOTOR CO. of Detroit, exclusively for**

## Harry S. Houpt

**68th Street & Broadway, New York City**

Address Sales Manager, Department T, for further information.

We are also manufacturing at our factory at Bristol, Connecticut, the Houpt Car, 60 H. P., 4 cyl. and 90 H. P., 6 cyl., which we will market in the early summer.

# READING STANDARD

# R-S Motorcycles

## The Most Advanced Quality Line For the Progressive Dealer

BELT AND CHAIN DRIVE MODELS.
MAGNETO OR BATTERY EQUIPMENT.

Loop frame models,
Diamond frame models,
Delivery van models,
Tri-car, chair car and tandem models

Single and Twin Mechanical Intake Valve Motorcycles from 3 to 7½ H P A line full of new and exclusive features, improvements and refinements. The Motorcycle for universal use, Economical, Powerful, Simple,—in short "AMERICA'S BEST"

Our Manufacturing Policy—Quality above everything else
Our Selling Policy—Protection to our selling agents.

WE LOOK FOR "LIVE WIRES" WHO WANT THE BEST. WRITE US.

1909 MODELS

Reading Standard Co., Reading, Pa.

# MOTOR BICYCLE

**Made in Detroit——————Runs Everywhere**

# "Regal 30"

## Champion of Real Test

## This is Certainly POSITIVE PROOF of Power and Endurance

## REGAL PLUGGER

**LEFT NEW YORK CITY JULY 7th—ARRIVING SAN FRANCISCO AUG. 12th. DISTANCE, 4,387 MILES**

**The first moderate-priced car to ever attempt and finish a run of this kind**

TELEGRAM

San Francisco, Aug. 12, 1909.

"REGAL PLUGGER" reached San Francisco today, completing 4,387 miles transcontinental trip in perfect condition. Accorded great reception.

GEORGE D. WILCOX.

4 Cylinder
30 Horsepower **$1250** Magneto and full Lamp Equipment included

**WRITE FOR BOOKLETS TODAY**

**REGAL MOTOR CAR CO., Detroit, Mich.**

# *Once Used Always Usea BECAUSE*

¶ They possess qualities absolutely not embodied in the ordinary spark plug. Their use means perfect ignition as a plug that will Spark in Water will not be affected by short-circuiting or fouling matter in any form. Tests have proven this and we desire that you give Reliance a trial in your motor and test for yourself.

¶ Experienced automobile and motor boat men recommend them either for water or air-cooled motors; they know that Reliance Spark Plugs outlast and give better satisfaction with less trouble than the plug you are now using.

¶ Less battery power is required to produce a good fat spark and there is less likelihood of cracked porcelain, because of our new heat-proof composition we use in the manufacture of our new porcelain.

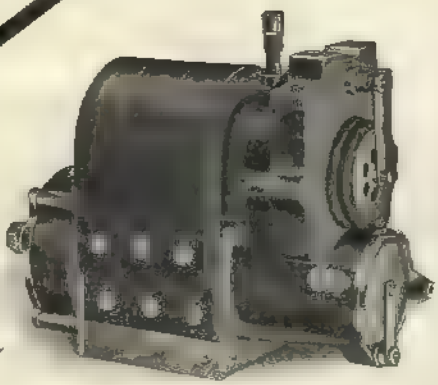
¶ Send for booklet and learn more of Spark Plugs and how to obtain perfect ignition.

## JEFFERY-DEWITT CO., 216 High St., Newark, N. J.

*S. & F. Stephenson—Agents for United Kingdom—19 Canning Pl., Liverpool, Eng.*
*Armand Frey & Co.—Agents for Continental Europe—Berlin, Germany.*

U&H MAGNETOS

# Magnetos for Every Purpose



Besides the well-known Type LE—the Self-Starting Magneto for motors of high power,—the Unterberg & Helmle line comprises the following models. Every one is a true high tension, arc flame magneto. The differences concern the size of motor for which the magneto is intended, and the presence or absence of separate battery provision.

**TYPE LB**—Similar to LE, but without the starting device, Price, $125

**TYPE CB**—Smaller than LB, and intended for 4-cylinder motors up to 35 h. p. Price, - - - - - - - - - $100

**TYPE LD**—For large motors. Carries a battery timer on the distributor shaft, and has a separate coil for battery use ONLY. The same distributor serves both systems, but the magneto proper is self-contained. Price, complete with coil and high tension switch, $150

**TYPE CD**—Same size as CB, but has same provision for dual ignition as LD. Price, complete - - - - - - $125

**TYPE CG-3**—For 2-cylinder vertical motors with cranks 180 degrees apart. Price, - - - - - - - - - $ 60

J.S. BRETZ COMPANY

Sole Importers — TIMES BUILDING. NEW YORK

# Remington Auto. Loading Shot Guns

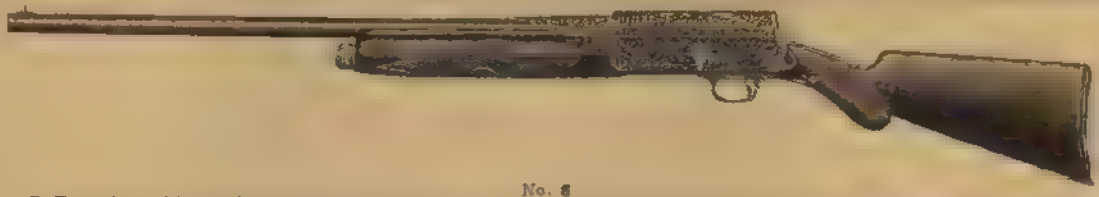
## MODEL 11

No. 1

12 Gauge 28 or 26 in. Barrels, Take Down, 5 Shot, Full or Modified Choke or Cylinder Bore, Wt. about 7¼ lbs., all with Remington Steel Barrels

| Grade | Each |
|---|---|
| **Model 11, No. 1–Standard,** Plain Walnut Stock, Pistol Grip | $40 00 |
| **Extra Barrels,** 26 or 28 in. | 16 00 |
| **Model 11, No. 2–Special,** Selected English Walnut Stock, Checkered Pistol Grip and Fore End | 50 00 |
| **Extra Barrels,** 26 or 28 in. | 16 00 |
| **Model 11, No. 3–Trap,** Selected English Walnut Stock, Checkered Straight Grip and Fore End | 50 00 |
| **Extra Barrels,** 26 or 28 in. | 16 00 |
| **Model 11, No. 4–Tournament,** Fine English Walnut Stock, Checkered Pistol Grip and Fore End, Scroll Engraving, Straight Grip to order without extra charge | 70 00 |
| **Extra Barrels,** 26 or 28 in. | 20 00 |
| **Model 11, No. 5 Expert,** Best English Walnut Stock, Checkered Pistol Grip and Fore End, Scroll and Game Engraving, Silver Name Plate | 100 00 |
| **Extra Barrels,** 26 or 28 in. | 25 00 |
| **Matted Rib,** add to above | 5 00 |

Fitting extra barrels to old guns can be done in San Francisco at a charge of $2.00 for fitting.



No. 6

| Grade | Each |
|---|---|
| **Model 11, No. 6–Premier,** Circassian Walnut Stock, Checked Walnut Stock and Fore End, Finest Quality Game and Scroll Engraving, Gold Name Plate | $150.00 |
| **Extra Barrels,** 26 or 28 in. | 30.00 |
| **Model 11, No. 0 Riot,** Plain Walnut Pistol Grip Stock, 20 in. Cylinder Bore Barrel | 40 00 |
| **Extra Barrels** | 16 00 |
| **Model 11, Matted Rib,** add to above | 5 00 |

All Grades carried in Stock with 28 in. Choke and Modified Bore Barrel.
No. 1 Grade Supplied with extra Cylinder Bore Barrel 28 in. when ordered from Factory only.

**For Parts, See Pages 1817-1818**

# Remington Repeating Shot Guns

## MODEL 10, 12 GAUGE

Trap Grade

**Take Down, Hammerless, Solid Breech**

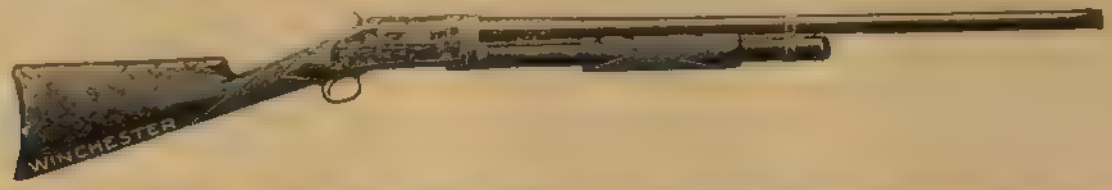
| | Each |
|---|---|
| **Model 10, No. 1, Standard Gun** Remington Steel Barrel, Walnut Pistol Grip Stock and Forearm, Choke Bore, Rubber Butt Plate, Matted Rib on Receiver, Regular Stock, Dimensions 13¾ in. Long, 2½ in. Drop at Heel, 1½ in. Drop at Comb, 12 Gauge 30 in. Wt. about 7¾ lbs. | $27 00 |
| **Model 10, Field Gun**–Remington Steel Barrel, Walnut Pistol Grip Stock and Forearm, Rubber Butt Plate, Cylinder Bore, Matted Rib on Receiver, Regular Stock, Dimensions 13¾ in. Long, 2½ in. Drop at Heel, 1½ in. Drop at Comb, Modified or Full Choke, 12 Gauge, 26 in. Wt. about 7¼ lbs. | 27 00 |
| **Model 10, No. 3, Trap Gun**–Ordnance Steel Barrel, Selected English Walnut Stock and Forearm, Finely Checkered, Rubber Butt Plate, Matted Rib on Receiver, Full Choke, Regular Stock, Dimensions, 14¼ in. Long, 2 in. Drop at Heel, 1½ in. Drop at Comb. 12 Gauge 30 in. Wt. about 7¾ lbs. | 47 00 |
| **Matted Rib,** add to above | 5 00 |

# Winchester Repeating Shot Guns

## TOURNAMENT GRADE

**Take Down**, 12 Gauge, Rolled Steel Barrel, Checkered Fancy Walnut Stock and Forearm, Straight Grip, Wt. 7¾ lbs.

| | Each |
|---|---|
| **Tournament Grade**—12 Gauge, 30 in. Barrel, Full Choke | $42 00 |




**Take Down**, 12 Gauge only, Rolled Steel Barrel, Matted, Elaborately Engraved Frame Checkered Fancy Walnut Stock and Forearm, Straight Grip, Wt. 7¾ lbs.

| | Each |
|---|---|
| **Pigeon Gun**—12 Gauge, 28 in. Barrel only, Factory only | $100 00 |
| **Pigeon Gun**—16 Gauge, 28 in. Barrel only, Factory only | 100.00 |

**For Extras and Deviations to above, See below**

**For Parts for above, See Page 1796**

## EXTRAS FOR MODEL 1897 SHOT GUNS

| | Each |
|---|---|
| Fancy Walnut Stock and Forearm, Not Checkered | $13.00 |
| Checking Stock | 5.00 |
| Extra Length or Drop of Stock, to order | 10.00 |
| Fancy Checkered Slide Handle, "Trap" or "Pigeon" Gun Grade | 5.00 |
| Good (3 Blade) Damascus Barrel in place of Rolled Steel, (Additional) | 15.00 |
| Fine (4 Blade) Damascus Barrel in place of Rolled Steel (Additional) | 20 00 |
| Interchangeable Barrel, Rolled Steel Complete with Magazine and Forearm | 15 00 |
| Interchangeable Barrel, Rolled Steel, Trap Grade, Complete with Magazine and Fancy Checkered Forearm | 20 00 |
| Interchangeable Barrel, Rolled Steel, Pigeon Grade, Matted, Complete with Magazine and Fancy Checkered Forearm | 25.00 |
| Interchangeable Barrel, Good (3 Blade) Damascus, Complete with Magazine and Forearm | 30.00 |
| Interchangeable Barrel, Fine (4 Blade) Damascus, Complete with Magazine and Forearm, | 35.00 |
| Matting Barrel | 5.00 |

**Any of the above Extras will be furnished from the Factory Only**

To Procure a New or Interchangeable Barrel for Winchester Shot Guns it will be necessary to send in the Entire Gun to us, that it may in turn be forwarded to the Winchester Repeating Arms Co., as this Factory will not sell or allow the Winchester Barrels to be Fitted by other than their own Workmen.

## MODEL 1893 STOCKS

The stock of the Model 1897 gun is longer and has less drop than the stock of the Model 1893. If so ordered, Model 1893 stocks will be furnished without extra charge from Factory only. Unless otherwise specified, Model 1897 stocks will be sent on all orders. The following table gives the lengths and drops of the Model 1897 and Model 1893 stocks —

| | Length. | Drop at Comb. | Drop at Heel. |
|---|---|---|---|
| Model 1897, | 13¾ inches | 1¾ inch | 2½ inches |
| Model 1893, | 13 inches | 1⅝ inch | 2¼ inches |

Any variation from these standard lengths or drops will be charged for extra.

# CAR AHEAD!

Weight 1700 lbs.

30 H.P. (Actual)

## RIDER-LEWIS "FOUR"

### The Biggest Little Car Ever Built

¶ In design, appearance and ability, the Rider-Lewis IV easily heads the list of popular priced cars.

**FEATURES:**

| | |
|---|---|
| Four Cylinders | Flexible Motor Supports |
| Valves in the Head | Rear Axle Gear Set, 3 Speeds |
| Magneto Ignition | Straight Line Drive |
| Thermo-Syphon Cooling | Light Weight |
| 32″ x 3½″ Tires | 100″ Wheel Base |

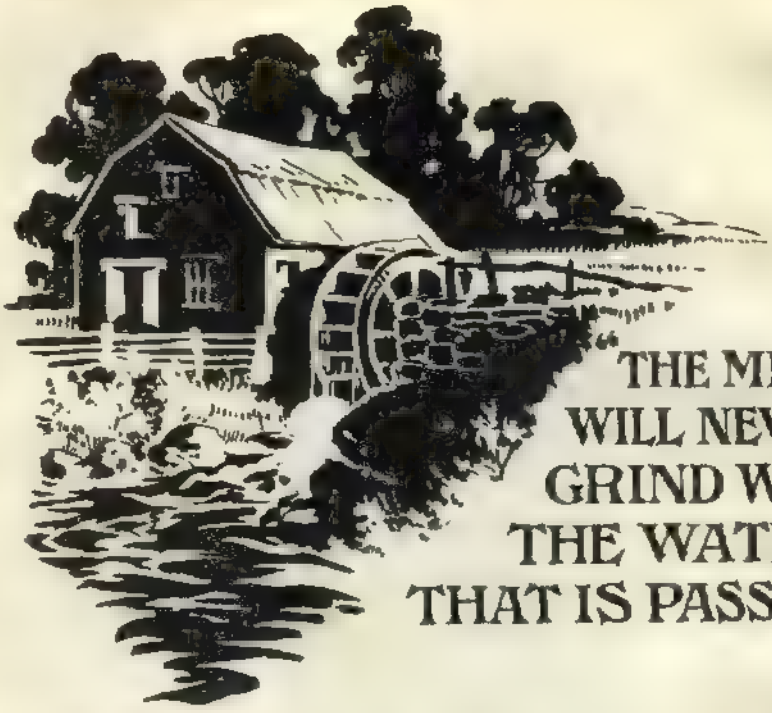
**Simplicity the Very Keynote of the Design**

**WE ALSO MANUFACTURE THE EXCELLENT SIX**
(The Most Luxurious of Cars), Price, $2500

CATALOG ON REQUEST. AGENTS GET OUR PROPOSITION

**Price, $1000**

**The Rider-Lewis Motor Car Co.**
Muncie and Anderson, Indiana




¶ Opportunities must be taken advantage of before it's too late. At present there is no better form of printed advertising than

# Commercial Post Cards

in natural colors as printed by the *Chiltonn Daylight Color Process*—because they never reach the waste basket.

¶ These cards are made to order to fit each particular case. What are your requirements?

¶ Will you allow us to send you samples and suggestions?

¶ We can outline a campaign suitable for your business.

## Chiltonn Printing Company
PHILADELPHIA

*We are the Largest Manufacturers of Commercial Post Cards in America*

# Riverside Adjustable Planes

Extra Quality and Finish, Extra Heavy Steel Laid Cutters, will not "Chatter." Cutters are Fully Warranted

## WOOD BOTTOM

### Bailey Pattern

| No. | Length | Cutter | Each |
|---|---|---|---|
| 22–Smooth, | 8 in. | 1¾ in. | $ 2.00 |
| 23–Smooth, | 9 in. | 1¾ in. | 2.00 |
| 24–Smooth, | 8 in. | 2 in. | 2.00 |
| 35–Handled Smooth, | 9 in. | 2 in. | $2.50 |
| 36–Handled Smooth, | 10 in. | 2⅜ in. | 2.75 |

| No. | Length | Cutter | Each |
|---|---|---|---|
| 26–Jack, | 15 in. | 2 in. | $ 2 25 |
| 27–Jack, | 15 in. | 2⅜ in. | 2.50 |
| 28–Fore, | 18 in. | 2⅜ in. | 2.75 |
| 29–Fore, | 20 in. | 2⅜ in. | 2.75 |
| 30–Jointer, | 22 in. | 2⅜ in. | $ 3 00 |
| 31–Jointer, | 24 in. | 2⅜ in. | 3 00 |
| 32–Jointer, | 26 in. | 2⅝ in. | 3 25 |

One in a Box

## IRON

### Bailey Pattern

| No. | Length | Cutter | Each |
|---|---|---|---|
| 2 –Smooth, | 7 in. | 1⅝ in. | $ 2.75 |
| 3 –Smooth, | 8 in. | 1¾ in. | 3.00 |
| 4 –Smooth, | 9 in. | 2 in. | 3.25 |
| 4½–Smooth, | 10 in. | 2⅜ in. | 3.75 |
| 5–Jack, | 14 in. | 2 in. | $ 3.75 |
| 6–Fore, | 18 in. | 2⅜ in. | 4.75 |
| 7–Jointer, | 22 in. | 2⅜ in. | 5.50 |
| 8–Jointer, | 24 in. | 2⅝ in. | 6.50 |

## IRON, CORRUGATED BOTTOM

### Bailey Pattern

| No. | Length | Cutter | Each |
|---|---|---|---|
| 4 C –Smooth, | 9 in. | 2 in. | $3.25 |
| 4½ C–Smooth, | 10 in. | 2⅜ in. | 3.75 |
| 5 C –Jack, | 14 in. | 2 in. | 3.75 |
| 6 C–Fore, | 18 in. | 2⅜ in. | $ 4 75 |
| 7 C–Jointer, | 22 in. | 2⅜ in. | 5 50 |
| 8 C–Jointer, | 24 in. | 2⅝ in. | 6.50 |

One in a Box

# Adjustable Planes

## BAILEY, WOOD BOTTOM

| No. | Length | Cutter | Each |
|---|---|---|---|
| 21–Smooth, | 7 in. | 1¾ in | $ 1.50 |
| 22–Smooth, | 8 in. | 1¾ in | 1.50 |
| 23–Smooth, | 9 in. | 1¾ in | 1.50 |
| 24–Smooth, | 8 in | 2 in | 1.50 |

| No. | Length | Cutter | Each |
|---|---|---|---|
| 35–Hdled Smooth, | 9 in. | 2 in | $1.90 |
| 36–Hdled Smooth, | 10 in. | 2⅜ in. | 2.00 |

| No | Length | Cutter | Each |
|---|---|---|---|
| 26 –Jack, | 15 in. | 2 in | $ 1.65 |
| 27 –Jack, | 15 in. | 2⅛ in | 1.90 |
| 27½–Jack, | 15 in. | 2¼ in | 1.90 |
| 28 –Fore, | 18 in. | 2⅜ in | 2.05 |
| 29 –Fore, | 20 in. | 2⅜ in | 2.05 |

| No. | Length | Cutter | Each |
|---|---|---|---|
| 30–Jointer, | 22 in. | 2⅜ in | $ 2.20 |
| 31–Jointer, | 24 in. | 2⅜ in. | 2.20 |
| 32–Jointer, | 26 in. | 2⅜ in. | 2.40 |
| 33–Jointer, | 28 in. | 2⅜ in. | 2.40 |

## STANLEY, WOOD BOTTOM

| No. | Length | Cutter | Each |
|---|---|---|---|
| 122–Smooth, | 8 in. | 1¾ in | $ 1.10 |

| No. | Length | Cutter | Each |
|---|---|---|---|
| 135–Hdled Smooth, | 10 in. | 2⅛ in | $1 50 |

| No. | Length | Cutter | Each |
|---|---|---|---|
| 127–Jack, | 15 in. | 2⅛ in | $ 1.50 |

| No. | Length | Cutter | Each |
|---|---|---|---|
| 129–Fore, | 20 in. | 2¾ in. | $ 1.65 |

All Above Packed One in a Box

# Riverside Hatchets

Extra Quality Cast Steel, Gold Bronzed, Polished Bit and Head

## SHINGLING

| No. Cut | Per Doz. |
|---|---|
| 1–3 ¼ in. | $ 8 00 |
| 2–3⅝ in. | 8.50 |
| 3–4⅛ in. | 9 00 |

One half Doz. in a box

## CLAW

| No. Cut | Per Doz. |
|---|---|
| 1–4½ in. | $ 9.00 |
| 2– [illegible] | 9 50 |
| 3 4 x in. | 10.00 |

## HALF

| No. Cut | Per Doz. |
|---|---|
| 1–3⅛ in. | $ 8 50 |
| 2–3½ in. | 9 00 |
| 3–3⅞ in. | 9 50 |

## BROAD

| No. Cut | Per Doz. |
|---|---|
| 1–4 in. | $10 50 |
| 2–4½ in. | 11 50 |
| 3–5 in. | 13 00 |
| 4–5½ in. | 14.50 |

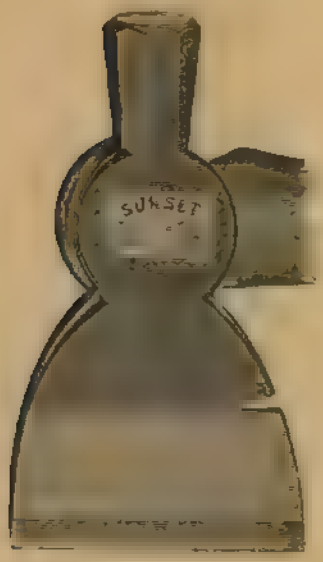
Single or Double Bevel, Always specify which is required

One-half Doz. in a Box

# Sunset Hatchets

Refined Cast Steel, Fire Bronze Finish, Polished Bit and Head

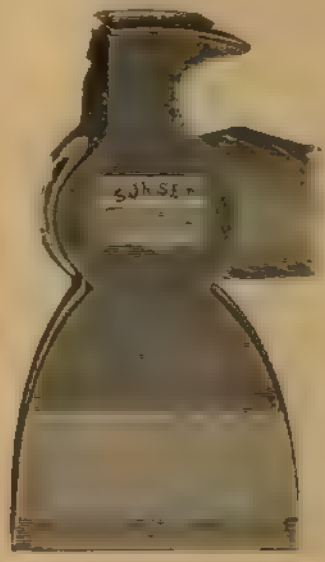
## SHINGLING




| No. | Cut | Per Doz. |
|---|---|---|
| 1 | 3½ in. | $ 8.00 |
| 2 | 3⅞ in. | 8.50 |
| 3 | 4⅜ in. | 9.00 |

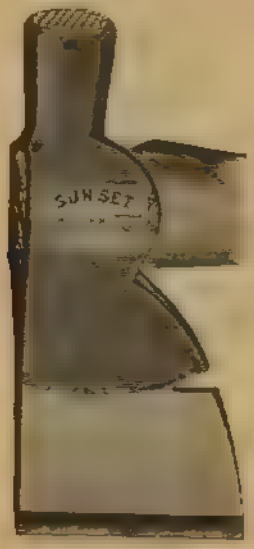
One-half Doz. in a box

## CLAW




| No. | Cut | Per Doz. |
|---|---|---|
| 1 | 3½ in. | $ 9.00 |
| 2 | 3⅞ in. | 9.50 |
| 3 | 4⅜ in. | 10.00 |

## LATH



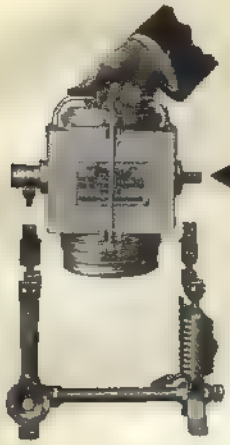

| No. | Cut | Per Doz. |
|---|---|---|
| 1 | 2½ in. | $ 8.00 |
| 2 | 2¾ in. | 8.50 |

One-half Doz. in a Box

## BROAD

| No. | Cut | Per Doz. |
|---|---|---|
| 2 | 4½ in. | $11 50 |
| 3 | 5 in. | 13.00 |
| 4 | 5½ in. | 14 50 |
| 5 | 6 in. | 16 50 |

Single or Double Bevel. Always specify which is required



Bracket fastens securely on running-board—no extras required.

# *Did you ever*

**see an acetylene generator that could be lifted from its fastenings for refilling?**

## The Neverout

TRADE MARK

PATENT

## Turn-Over Generator

lifts from its fastenings for this purpose—a great convenience. You take the generator to the water—not the water to the generator.

¶ Besides, the bracket is a patent purifier which cleanses the gas, insuring a pure white light, greatly increasing the efficiency of the searchlights.

¶ The *Neverout* Patent Turn-Over Generators are the only perfect generators for lighting automobiles or motor boats, as is amply attested by the most discriminating users in the U. S. and abroad. The U. S. Government uses the *Neverout* at Panama.

¶ Made in one or two cylinders.

***Write now for Catalog***

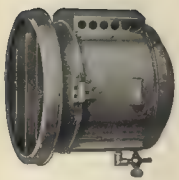
## ROSE MANUFACTURING CO.

## 911 ARCH ST., PHILADELPHIA, U. S. A.

*Sole Manufacturers of the Celebrated Neverout Double Focus Searchlight, the Only Steady and Unwavering Searchlight*

# RUSHMORE SEARCHLIGHTS

give the most of
lighting value
for the money,
the greatest durability,
the fewest
and easiest repairs.



## RUSHMORE GENERATORS

stand alone
among their kind
in reliability,
convenience,
ease of recharging, and
freedom from waste
when not in use.

## RUSHMORE DYNAMO WORKS

PLAINFIELD, NEW JERSEY

CHICAGO, ILL. LONDON PARIS

# "S and S" Hand Tachometer

These instruments are based on the action of the centrifugal force on weights pivoted on a rotating spindle. The movement of these weights is controlled by gravity or by springs, and is indicated by a pointer mechanically connected to them. The pointer, therefore, at any movement indicates on the dial the exact position of the rotating weights.

The pointer gear is provided with an efficient damping action, which does not affect the accuracy of the readings but insures a steady movement of the pointer.

The power required to drive the Tachometer is so small as to be practically negligible.

The single driving spindle serves for all four speed ranges which are 30-120, 100-400, 300-1000, 1000-4000 R. P. M. Any one of the four speed ranges can be thrown into action by moving the thumb-slide on the face of the instrument up or down. The change from one speed to another can be effected while the Tachometer is recording.

They are mounted in aluminum alloy cases, highly polished and lacquered. To render them universally applicable, each instrument is supplied with suitable accessories, viz: triangular steel points, rubber points and funnel centers, extension bar for the spindle and disc pulley. The weight of each instrument is 13 ounces while the total weight, combined with leather case and all accessories is 23 ounces.

Price each .... $60 00

# Savage Automatic Pistols

**32 Caliber**

Each

Capacity of Magazine 10 shots, Weight 19 ounces, Length over all 6 ¾ inches, Blue Finish, Metal Stock, Bead . . . $ 15 00

For Parts, see Page 1834A

# Liquid Pistol

**Wizard**

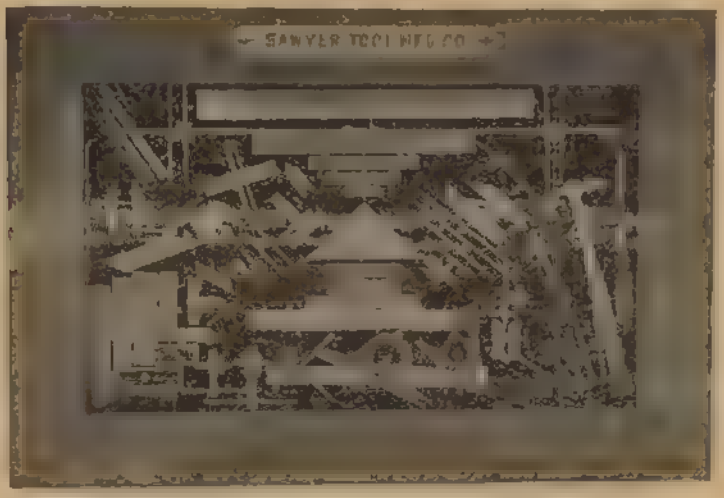
Per Doz

Nickel Plated, discharges and fills by pulling the trigger . . . . . $ 6.00

# Machinists Tools

## SAWYER TOOL MFG. CO'S. TOOL ASSORTMENTS IN CASES

Frames are Made of Quartered Oak Nicely Finished




Tools are Protected by Glass. Case is practically impervious to Moisture

No.
1 Assortment of Tools only (Not Including Case) . . . . List About $75.00
Case 23x65 in. (with Glass) . . . . . 10 00
Shipping Weight Complete 125 Pounds

Quartered Oak Cases Nicely Finished

Case No. 2 is made Flat. Front is 3 Feet Wide by 5 Feet High by 4 in. Deep.

Case No. 3 is made to fit on a Corner. Each Front is 2 Feet Wide by 5 Feet High by 4¾ in. Deep. Doors swing out

Cases No. 2 and 3 are shipped from Factory without Glass.

Assortment of Tools may be selected by purchaser if desired. Total list to be not less than shown

No. Each
2-Assortment of Tools only.....List About $200.00
Case-(without Glass) ..... 20.00
Shipping Weight Complete 250 Pounds

No. Each
3-Assortment of Tools only.....List About $200.00
Case-(without Glass) ..... 20.00
Shipping Weight Complete 250 Pounds

For Shipment From Factory Only

# Machinists Tools

## CROSS LEVEL

Enameled Body, Polished Ends. Invaluable for quickly leveling up work

Size 2½x3x⅝ inches.

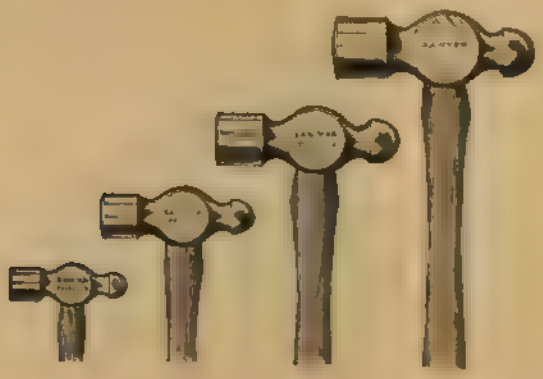
| No. | Each |
|---|---|
| 5 | $ 0.65 |

## STEEL CLAMPS

Made from steel and case hardened. They are **strong** where **strength is required** and are built to be used. The screws have a **ball and socket bearing** upon the jaws, thus eliminating all unnecessary strain from the threads.

**No. 12**

| Length Jaw | Opening | Each |
|---|---|---|
| 2 in. | 1¼ in | $ 0.65 |
| 3 in. | 2 in | 85 |
| 4 in. | 2¾ in | 1.00 |



## SAWYERS HAMMERS

Drop Forged from Best Tool Steel, Hardened by special process, and highly polished. They hang **just right**

Fully Warranted

**No. 130**

| Size No | Weight | Each |
|---|---|---|
| 1 | 4 oz | $ 1.00 |
| 2 | 12 oz | 1.40 |
| 3 | 20 oz | 1.70 |
| 4 | 24 oz | 2 00 |

Weight does not include Handles

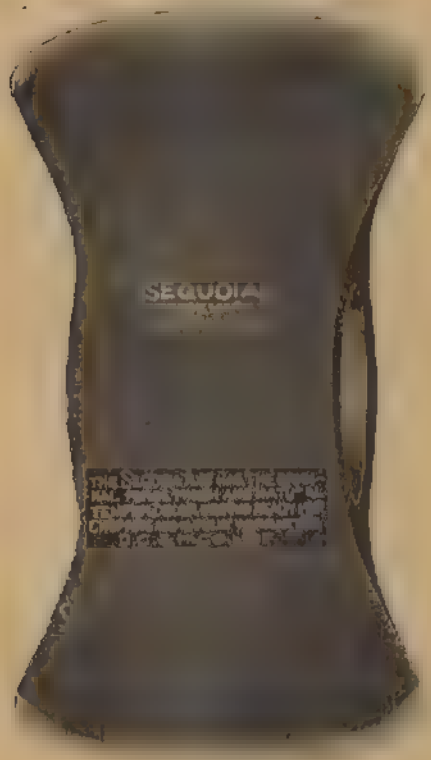
## SAWYERS MARKING OUTFIT

For Etching Names on Tools etc The outfit consists of a jointed steel scriber, one bottle of varnish, one bottle of etching fluid, one bottle of cleaning fluid, a camel s hair brush and directions for using, all in a neat wooden box

| No. | Each |
|---|---|
| 3 | $ 1 00 |

# Double Bit Axes

SEQUOIA




California Reversible Pattern

MANNS

Swamping Pattern

## SEQUOIA

Hand Made Rustless Gun Metal Finish, Extra Quality Crucible Steel

Fully Warranted

Unhandled

| No. | | Base Per Doz. |
|---|---|---|
| 31 | California Reversible Pattern | $20 00 |
| 32 | Falling Pattern | 20 00 |
| 33 | Youngs Pattern | 20 00 |
| 34 | Swamping Pattern | 20 00 |

One Doz. in a Case

## ROBT. MANNS

Bronzed, Superior Cast Steel, Polished Bits

Unhandled

| No | | Base Per Doz. |
|---|---|---|
| 71 | California Reversible Pattern | $20 00 |
| 72 | Falling Pattern | 20 00 |
| 73 | Youngs Pattern | 20 00 |
| 74 | Swamping Pattern | 20 00 |
| 75 | Humboldt Pattern | 20 00 |

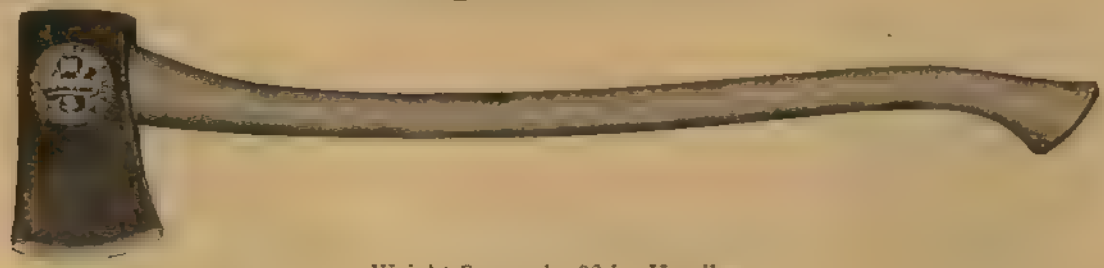
One Doz. in a Case

Weights 3¼, 3½, 3¾, 4 and 4½ pounds or Assorted as desired

For Classification of Advances over Base Prices, See Page 2

Clean Cut

# Freighters Axes



Weight 3 pounds, 32 in. Handles

| No. | | Per Doz. |
|---|---|---|
| 16 | **Clean Cut Polished**, Full Polished and Etched—Warranted | $16.00 |
| 26 | **Clean Cut Special**, Rustless "Gun Metal" Finish—Warranted | 15.00 |
| 66 | **Sunset**, Gold Bronzed, Polished Bit | 14.00 |

One Doz. in a Case

# Boys Axes

Weight 2¼ pounds, 28 in. Handles

| No. | | Per Doz. |
|---|---|---|
| 18 | **Clean Cut Polished**, Full Polished and Etched—Warranted | $15 00 |
| 28 | **Clean Cut Special**, Rustless "Gun Metal" Finish—Warranted | 14 00 |
| 68 | **Sunset**, Gold Bronzed, Polished Bit | 13 00 |
| 88 | **Red Ridge**, Painted Red, Polished Bit | 12.00 |

One Doz. in a Case

# Hunters Hatchets

**Clean Cut Special**

Rustless "Gun Metal" Finish—Warranted

| No. | Weight | Cut | Handle | Per Doz. |
|---|---|---|---|---|
| 000 | 14 oz. | 2⅛ in. | 14 in. | $11.00 |

**Clean Cut Polished**

Full Polished and Etched—Warranted

| No. | Weight | Cut | Handle | Per Doz. |
|---|---|---|---|---|
| 000 | 14 oz. | 2⅛ in. | 14 in. | $12.00 |

**Clean Cut Special**

Rustless "Gun Metal" Finish —Warranted

| No. | Weight | Cut | Handle | Per Doz. |
|---|---|---|---|---|
| 0 | 1¼ lb. | 3¼ in. | 14 in. | $10.00 |
| 1 | 1½ lb. | 3¼ in. | 16 in. | 11.00 |
| 2 | 1¾ lb. | 4 in. | 18 in. | 12.00 |

**Clean Cut Polished**

Full Polished and Etched—Warranted

| No. | Weight | Cut | Handle | Per Doz. |
|---|---|---|---|---|
| 0 | 1¼ lb. | 3¼ in. | 14 in. | $11.00 |
| 1 | 1½ lb. | 3¼ in. | 16 in. | 12 00 |
| 2 | 1¾ lb. | 4 in. | 18 in. | 13.00 |

**Riverside**

Gold Bronzed Polished Head and Bit

| No. | Weight | Cut | Handle | Per Doz. |
|---|---|---|---|---|
| 1 | 1½ lb. | 3¼ in. | 16 in. | $10 00 |
| 2 | 1¾ lb. | 4 in. | 18 in. | 11.00 |

**Sunset**

Gold Bronzed, Polished Bit

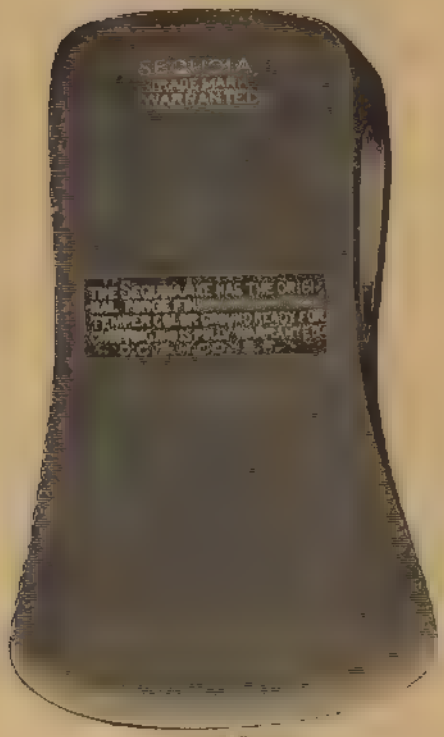
| No. | Weight | Cut | Handle | Per Doz. |
|---|---|---|---|---|
| 1 | 1½ lb. | 3¼ in. | 16 in. | $ 9 00 |
| 2 | 1¾ lb. | 4 in. | 18 in. | 10.00 |

One half Doz. in a box.

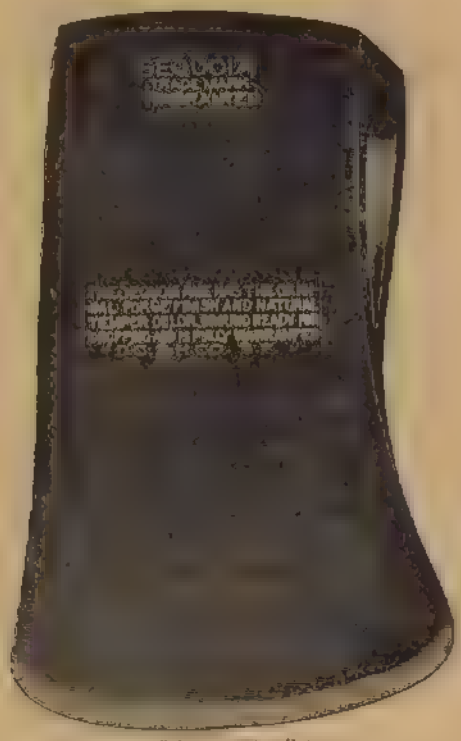
Above weights do not include handle

# Single Bit Axes

SEQUOIA




Michigan Pattern



California-Ohio Pattern

Hand made, Rustless Gun Metal Finish, Extra Quality Crucible Steel, Fully Warranted

**Unhandled**

| Michigan Pattern No. | Base Per Doz. | California-Ohio Pattern No | Base Per Doz. |
|---|---|---|---|
| 30 | $15.00 | 35 | $15.00 |

**Handled**

| Michigan Pattern No. | Handles | Base Per Doz. | California-Ohio Pattern No. | Handles | Base Per Doz. |
|---|---|---|---|---|---|
| 30 | A–"Q" | $23.00 | 35 | A–"Q" | $23.00 |
| 30 | C–Sequoia | 22.00 | 35 | C–Sequoia | 22.00 |
| 30 | E–Clinton | 21.00 | 35 | E–Clinton | 21.00 |
| 30 | F Yosemite | 20.00 | 35 | F–Yosemite | 20.00 |
| 30 | G–Sunset | 19.00 | 35 | G Sunset | 19.00 |
| 30 | H–Comstock | 21.00 | 35 | H Comstock | 21.00 |
| 30 | K–Extra | 20.00 | 35 | K–Extra | 20.00 |
| 30 | L–Excelsior | 19.00 | 35 | L Excelsior | 19.00 |
| 30 | M–No. 1 | 18.50 | 35 | M–No. 1 | 18.50 |

Weights 3, 3¼, 4, 4½ and 5 pound or Assorted 3 to 4, 3¼ to 3¾, 3½ to 4½ and 4 to 5 pounds

One Doz. in a Case.

**For Classification of Advances over Base Prices, See Page 2**

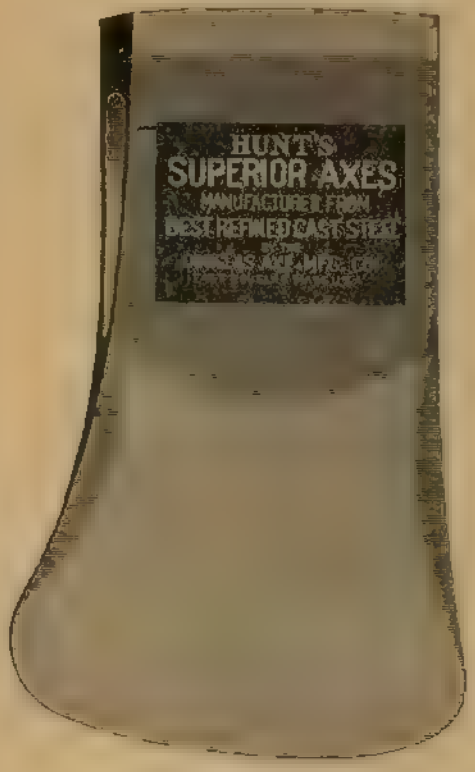
# Single Bit Axes

YOSEMITE

California-Ohio Pattern

Painted Black, Polished Head and Bit
Extra Quality Cast Steel

HUNTS




California-Ohio Pattern

Painted Black, Polished Head and Bit
Best Refined Cast Steel

### Yosemite Unhandled

| No. | Base Per Doz. |
|---|---|
| 40 | $14.00 |

### Hunts Unhandled

| No. | Base Per Doz. |
|---|---|
| 50 | $14.00 |

### Yosemite Handled

| No. | Handles | Base Per Doz. |
|---|---|---|
| 40 A | "Q" | $22 00 |
| 40 C | Sequoia | 21 00 |
| 40 E | Clinton | 20 00 |
| 40 F | Yosemite | 19 00 |
| 40 G | Sunset | 18 00 |
| 40 H | Comstock | 20 00 |
| 40 K | Extra | 19.00 |
| 40 L | Excelsior | 18.00 |
| 40 M | No. 1 | 17.50 |
| 40 N | No 2 | 17.00 |

Weights 3, 3¼, 4 and 4½ pounds and Assorted 3 to 4, 3¼ to 3¾, 3½ to 4½ and 4 and 5 pounds

### Hunts Handled

| No. | Handles | Base Per Doz. |
|---|---|---|
| 50 A | Q | $22 00 |
| 50 C | Sequoia | 21 00 |
| 50 E | Clinton | 20 00 |
| 50 F | Yosemite | 19.00 |
| 50 G | Sunset | 18.00 |
| 50 H | Comstock | 20.00 |
| 50 K | Extra | 19 00 |
| 50 L | Excelsior | 18 00 |
| 50 M | No. 1 | 17 50 |
| 50 N | No. 2 | 17.00 |

Weights 3, 3½, 4, 4½, 5, 5½ and 6 pounds or Assorted 3 to 4, 3¼ to 3¾, 3½ to 4½, and 4 to 5 pounds.

One Doz. in a Case.

**For Classification of Advances over Base Prices, See Page 2**

## NEEDLES.

## AMERICAN MACHINE NEEDLES

## DARNING NEEDLES.

## PACKING NEEDLE.

## FINE STEEL BODKIN

## BTL. WELL'S HIGH GRADE NEEDLES

75c

75c

## NEEDLE BOOKS

colors & silver.

N98—"Darn It" Hose Needle. Fiesta. Assd. 10 needles, 14 to 18 on card. 1 doz. cards in box. Doz. cards, 14c.

## NEEDLE EMERY CUSHION.

## STEEL KNITTING NEEDLES

Grn. 35c

## CLOVE & STOCKING DARNERS

*Note the price on this familiar article.*

22c

N58—Cruets moulded for dark hose. 1 doz. in bill

36c

## HOUSEHOLD TREASURE NEEDLE BOOK.

*Attractive offering backed by good value*

28c

## Knitting Needle Set.

## SEWING MACHINE BELTS

## FSFL FINE AIR HEELS

Per M, $1.18
Per M, $1.20

N5, 3-9, 4-8, 5-10. Between, 1-6, 3-9, 4-8, 5-10.

N39, "Crowley"

## THIMBLES

N283—Cover thimble, 4 papers assd. needles, 6 assd. darning needles, 1 bodkin, 6 assd. tapestry needles

## THIMBLE ASSORTMENTS.

N254—White metal, 2 doz. assd. sizes in glove case.

## "NEW IDEA" SEWING NEEDLES

Box, 42c

N287, 4 fold litho card, 1 bodkin, 6 assd. darning, 40 bright pins, 40 japanning pins, 7 assd. glass head pearl pins, 8 japanned hair pins, 4 papers assd. needles. Each in envelope. 8 doz. in box. Doz. 42c

N479—Assd. 3 doz. in box. Doz. 42c

N285—Imported stiffened german silver elec.

## CROWLEY'S NEW HANDY ASST. MACHINE NEEDLES.

N2009—Consists of 2 doz.

Needles to tube

## FANCY NEEDLE CASE.

N484—

Case and Interchangeable List Free.

Complete, $4.75

Extra tubes for above cabinet will be furnished at 30c per dozen tubes.

Tes, cloth stock. 1 assd. in packet. Doz. 30c

## CROCHET NEEDLES.

## HIGH GRADE MACHINE NEEDLES

## ENAMEL LINED

37c

doz. in plush lined compartment box assd. numbers

## WORKING WOMEN'S THIMBLES

N478—Open end, assd. medium and sizes, otherwise as N676.

## PURE ALUMINUM THIMBLE

## NEEDLE THREADING THIMBLE

$1.18

N258—Century

# L. C. Smith Double Barrel Hammerless Guns

Monogram Ejector

| Grade | Each |
|---|---|
| *3 –Nitro Steel, or Damascus Steel Barrels, carefully selected English Walnut Stock, Straight or Pistol Grip, Nicely Engraved, 12, 16 and 20 Gauge | $100.00 |
| 3E–With Automatic Ejector, otherwise same as Grade 3 | 115 00 |
| *Pigeon Pigeon Nitro Steel or High Grade Damascus Steel Barrels, French Walnut Stock, Straight or Pistol Grip, Handsomely Engraved, Regular or Monte Carlo Stock, 12, 16 and 20 Gauge | 125 00 |
| *Pigeon Ejector, otherwise same as Pigeon | 140.00 |
| *4 No. 4 Nitro Steel or High Grade Damascus Barrels, French or English Walnut Stock, Straight or Pistol Grip, Hand Engraved, Regular or Monte Carlo Stock, 12, 16 and 20 Gauge | 150 00 |
| *4E–With Automatic Ejector, otherwise same as Grade 4 | 165 00 |
| *5 No. 5 Nitro Steel or Extra Fine Damascus Steel Barrels, French or English Walnut Stock, Straight or Pistol Grip, Elaborately Engraved, 12, 16 and 20 Gauge | 200 00 |
| *5E With Automatic Ejector, otherwise same as Grade 5 | 215 00 |
| *Monogram Finest Damascus or Sir Joseph Whitworth Fluid Compressed Steel Barrels, English, French or Circassian Walnut Stock, Straight or Pistol Grip, Regular or Monte Carlo Stock, Beautifully Engraved, 12, 16 and 20 Gauge | 350 00 |
| *Monogram Ejector, otherwise same as Monogram | 365 00 |

| Grade | Each |
|---|---|
| *A2–Automatic Ejector only, Whitworth Fluid Compressed Steel or Fine Damascus Barrels, French, English or Circassian Walnut Stock, Selected Figure, Regular or Monte Carlo Stock, 12, 16 and 20 Gauge | $390 00 |
| Above fitted with "Hunter One Trigger" Extra | 25.00 |
| *A3–Automatic Ejector only, Whitworth Compressed Steel Barrels, Best Circassian Walnut Stock, Hand Made Locks, Elegantly Engraved Case, Inlaid with Gold, Straight or Pistol Grip, Regular or Monte Carlo Stock 12, 16 and 20 Gauge | 740 00 |

Any Special Features desired may be Embodied in this Gun.

"HUNTER ONE TRIGGER" TO ANY SMITH GUN ADD 25 00

Guns fitted with Single Trigger carried in Stock in OE, 1E, 2E and 3E Grades.

Standard Length Barrels, 12 Gauge, 30 in.; 16 and 20 Gauge, 28 in.

*From Factory Only

For Parts, See Page No. 1813

# L. C. Smith, Double Barrel, Hammerless Guns

| Grade | Each |
|---|---|
| 00 –Armor Steel Barrels, English Walnut Stock, Half Pistol Grip, 12, 16 and 20 Gauge | $37.00 |
| 00 E–With Automatic Ejector, otherwise same as Grade 00 | 50.00 |

| Grade | Each |
|---|---|
| 0 –Damascus or London Steel Barrels, English Walnut Stock Half Pistol Grip only, 12, 16 and 20 Gauge | $47.00 |
| 0 E–With Automatic Ejector, otherwise same as Grade 0 | 60.00 |

| Grade | Each |
|---|---|
| *1 –No. 1 Damascus or Special Steel Barrels, Good English Walnut Stock, Half Pistol Grip only, 12, 16 and 20 Gauge | $60.00 |
| 1 E–With Automatic Ejector, otherwise same as Grade 1 | 75 00 |

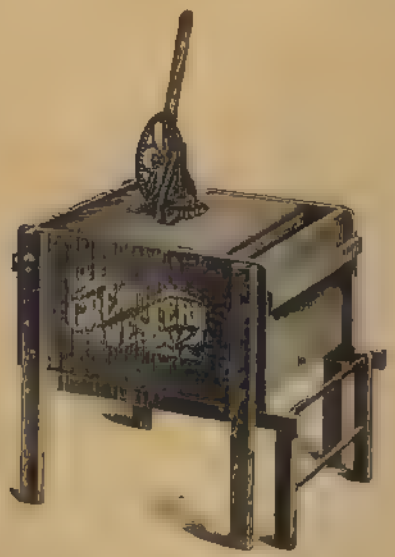
| Grade | Each |
|---|---|
| 2 –New Crown Steel or Chain Damascus* Barrels, Good Quality English Walnut Stock, Straight or Pistol Grip, 12, 16 and 20 Gauge | $80 00 |
| 2 E–With Automatic Ejector, otherwise same as Grade 2; 12, 16 and 20 Gauge | 95 00 |

Standard Length Barrels 12 Gauge, 30 in., 16 and 20 Gauge, 28 in. **For Parts, see Page 1813**

*From Factory only

# Washing Machines

WESTERN



**No. 2–Western**–Made of well seasoned wood, handsomely finished, and all Castings are fully Japanned. Inside dimensions 17¾x23¾ in.
Each . . . . . $ 6.50
Shipping Weight, 68 pounds each

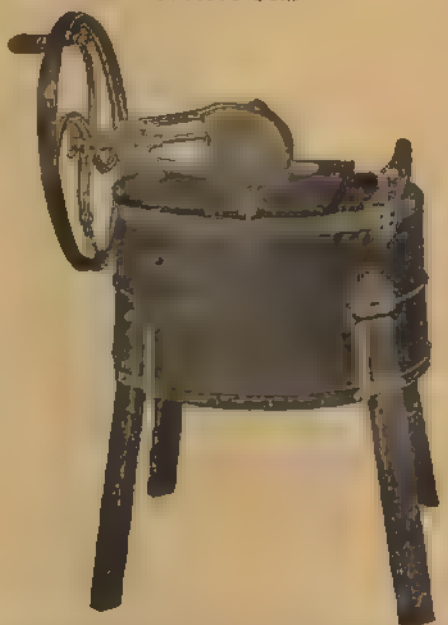
RAPID

**Rapid**–Made of seasoned Virginia Pine, handsomely finished; Hoops made of Extra Heavy Galvanized Wire, and Electric Welded Detachable Legs. The best low priced Washer
Each . . . . . $ 6.50
Shipping Weight, 58 lbs. each

SNOW WHITE
Covered Gear

**Snow-White**–Made of Kiln-dried Louisiana Red Cypress, handsomely finished with copper-bronze hoops. Aluminum Bronze Gearing. Legs are solid with the tub Ball Bearing. This machine allows no escape of steam, preventing disagreeable odors from permeating the house. Fully Guaranteed.
Each . . . . . $12 00
Shipping Weight 80 pounds each

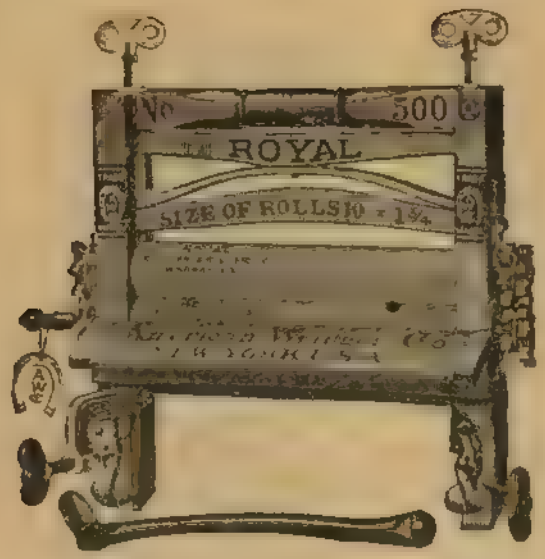
MAJESTIC ROTARY
Covered Gear



**Majestic**–Made of seasoned Virginia White Cedar, finished in natural color of wood, with Aluminum Bronzed Gearing. Electric Welded Wire Hoops sunk in grooves. Detachable Legs; Ball Bearings; very easy running. Every One Fully Guaranteed.
Each . . . . . $12.00
Shipping Weight, 80 pounds each

# Clothes Wringers

## ROYAL




Regular Bearings, Warranted Rolls

| No. | Size Rolls | Per Doz. |
|---|---|---|
| 500 | 10x1¾ in. | $49.00 |
| 501 | 11x1¾ in. | 55 00 |
| 502 | 12x1¾ in. | 60.00 |

## CHEMICAL

Ball Bearings, Enclosed Cogs, Warranted Rolls
Rolls will withstand the effect of chemicals contained in soap and washing compounds

| No. | Size Rolls | Per Doz. |
|---|---|---|
| 1080 E | 10x1¾ in. | $66.00 |
| 1081 E | 11x1¾ in. | 72.00 |

## NOVELTY

Regular Bearings, Warranted Rolls

| No. | Size Rolls | Per Doz. |
|---|---|---|
| 300 | 10x1¾ in. | $42.00 |
| 301 | 11x1¾ in. | 48.00 |
| 302 | 12x1¾ in. | 53 00 |

## NOVELTY (Enclosed Gear)

Ball Bearings, Enclosed Cogs, Warranted Rolls

| No. | Size Rolls | Per Doz. |
|---|---|---|
| 390 E | 10x1¾ in. | $50.00 |
| 391 E | 11x1¾ in. | 55.00 |

All Packed in ½ and ½ Doz. Cases

# The Automobile World Recognizes

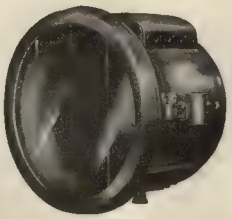
# SOLAR LAMPS

## as Standard

¶ **OVER 20 AMERICAN MANUFACTURERS** equip with Solars, because they enhance the value of every car and improve its appearance.

¶ **DEALERS** recommend Solars, because they give absolute satisfaction—and satisfaction means permanent customers.

¶ **OWNERS AND DRIVERS** prefer Solars, because they are absolutely dependable under all circumstances – they make touring at night safe and enjoyable.



**The Badger Brass Mfg. Company**

**Two Factories:**
**KENOSHA, WIS.**
**437 Eleventh Ave., N. Y.**

## Best Material

## Best Workmanship Best Design

***That's what you secure when you purchase***

# SOLAR LAMPS

**EVERY SOLAR LAMP** is backed by 12 years of cumulative experience in the building of motor car lamps. The most improved machinery. The largest and without question the most thoroughly equipped factory in the world.

**EVERY SOLAR LAMP** possesses the unqualified endorsement of the motoring public. It is preferred and used by the greater majority of American Manufacturers. It is found on ALL cars whose owners desire a perfect lamp—one that embodies up-to-date ideas in motor lamp construction.

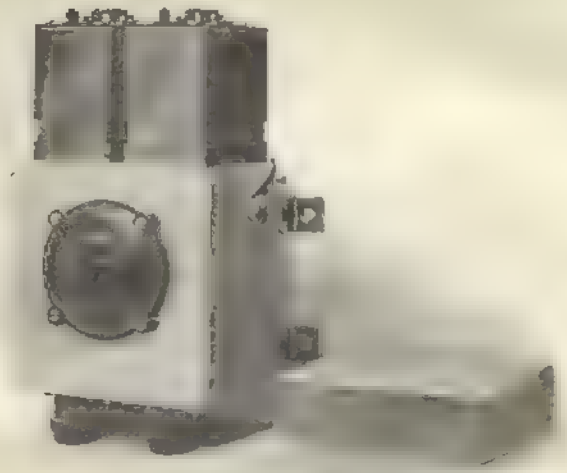
**Do not accept any but Solars. See that they are "part equipment" of your 1909 car**

*Write for 1909 catalog*

## BADGER BRASS MFG. COMPANY

TWO FACTORIES:

**Kenosha, Wis.** **437 Eleventh Ave., N. Y.**



# HEINZE IGNITION APPARATUS

¶ We make a complete line of Coils, Spark Plugs, Timers and Magnetos, low or high tension.

SEND FOR OUR 1909 CATALOGUE

## HEINZE ELECTRIC COMPANY

Factory and Main Office: LOWELL, MASS.

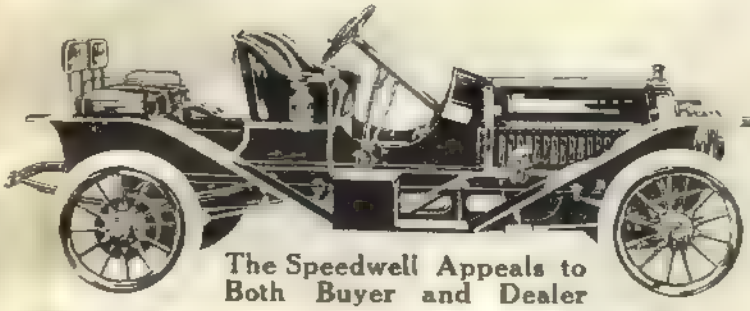
# The Best Car That Can Be Built

THE

# Speedwell

# $2500

**Fully Equipped**



40 45 Horse Power

**Roadster**

Bosch Magneto included in standard equipment on all models.

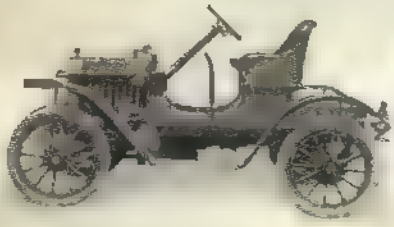
**The Speedwell Appeals to Both Buyer and Dealer**

[illegible] the **Speedwell** is the greatest automobile value at [illegible] price
[illegible] such a car as the **Speedwell** is a ready seller and does not come back to the shop for [illegible]
A **Speedwell** will stand a deeper strain of harder usage than will ever be required of it.
[illegible] that [illegible] the same service as the **Speedwell** are not sold for as low as $2500.

**THE SPEEDWELL MOTOR CAR COMPANY, DAYTON, OHIO**

New York Office 2002 Broadway at 68th St. Chicago Office—1355 Michigan Ave. at 14th St





# BRUSH

## Selling Qualities

Every automobile dealer should carefully consider the selling qualities of the Brush Runabout. In the first place, it is a high-grade car selling at a low price. It is a car of simple design, built well—not a complicated design built cheaply. In its construction it embodies all the elements of the high-grade car—it incorporates all that is necessary to insure every-day service—year in and year out. It gives the most service at least cost of any car built. The Brush sells easily and when sold it stays sold and sells many others. Know the definite truth of our statements. We invite inquiry and the opportunity to submit to you facts which cannot fail to be interesting. We offer exceptional opportunities to those who get in touch with us now.

**BRUSH RUNABOUT COMPANY**

**55 BALTIMORE AVE., DETROIT, MICH.**

MEMBERS A. M. C. M. A.

# AGAIN!

First on Land, First on Sea,
First in the Hearts of All Motormen

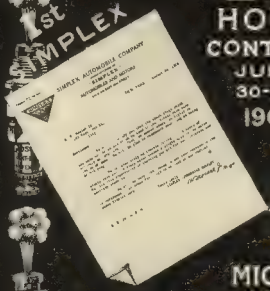
Mosler **Spit Fire**

## Lead the World

AS USUAL

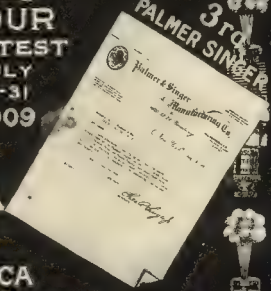
UNEQUALLED FOR SPEED AND ENDURANCE

1st SIMPLEX



24 HOUR CONTEST JULY 30-31 1909

3rd PALMER SINGER



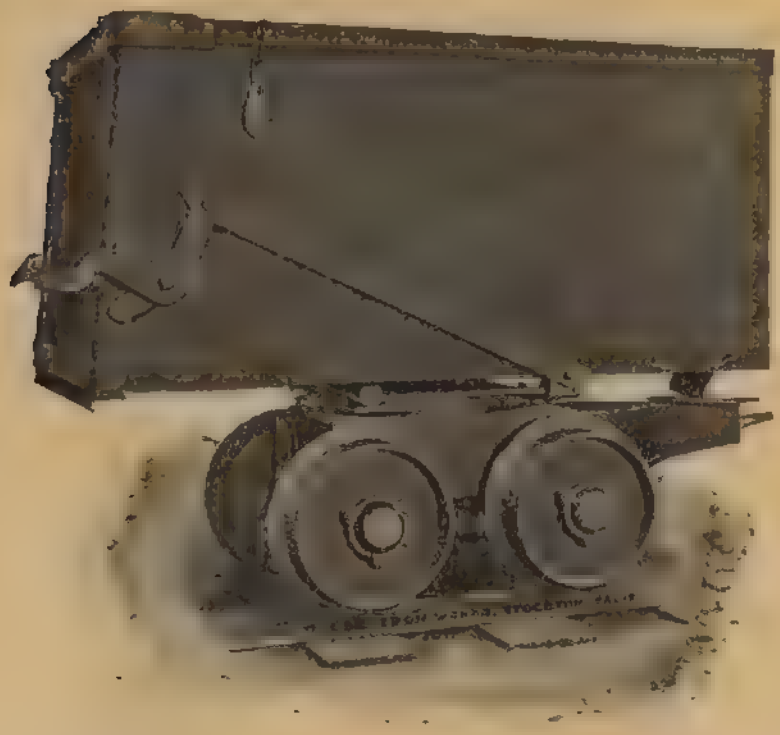
MICA AND MAGNETO TYPE

DUPLICATES OF THESE RACING PLUGS YOURS FOR THE ASKING

AT ALL JOBBERS AND DEALERS OR DIRECT

A. R. MOSLER & CO. 163 W 29TH ST. NEW YORK.

# Standard Truax Ore Cars



Fitted with Self Oiling Wheels and Malleable Iron Dust Caps Malleable Iron Hook and Chain to hold the Door open when necessary. The Automatic Opening and Closing Door does away with the Lever in back and all of its disadvantages The Door cannot commence to open until Bed of Car is at an angle of four degrees and is not fully released until the bed is at an angle of twelve degrees The Automatic Door holds the Ore in Car until partially dumped After the load is dumped the Door returns to its original position and is automatically locked and wedged in place by patent Door Catches. The Cars are fitted with Malleable Iron Turn Tables so they can be dumped on either side as well as to the front.

| Number | Capacity Cubic Feet | Width of Body, in. | Length of Body, in | Height of Body, in | Height from Top of Track, in. | Shipping Weight pounds | Diameter of Wheels in. | Gauge of Track, in | Thickness of Steel in Sides | Thickness of Steel in Bottom | Base |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14A | 13 | 24 | 44 | 21 | 35 | 460 | 10 | 18 | No. 12 | No. 8 | |
| 14B | 13 | 24 | 44 | 21 | 35 | 470 | 10 | 18 | 12 | 1/4 | |
| 14C | 13 | 24 | 44 | 21 | 35 | 515 | 10 | 18 | 10 | 1/4 | |
| 14D | 13 | 24 | 44 | 21 | 35 | 555 | 10 | 18 | 3/16 | 1/4 | |
| 17A | 16 | 24 | 48 | 24 | 38 | 510 | 10 | 18 | 12 | 5/16 | |
| 17B | 16 | 24 | 48 | 24 | 38 | 565 | 10 | 18 | 10 | 1/4 | |
| 17C | 16 | 24 | 48 | 24 | 38 | 650 | 10 | 18 | 3/16 | 1/4 | |
| 20A | 14½ | 24 | 44 | 24 | 38 | 525 | 10 | 18 | 10 | 5/16 | |
| 20B | 14½ | 24 | 44 | 24 | 38 | 550 | 10 | 18 | 10 | 1/4 | |
| 20C | 14½ | 24 | 44 | 24 | 38 | 600 | 10 | 18 | 3/16 | 1/4 | |
| 20D | 14½ | 24 | 44 | 24 | 38 | 650 | 10 | 18 | 1/4 | 1/4 | |
| 19A | 22½ | 30 | 54 | 24 | 41 | 750 | 12 | 18 | 10 | 5/16 | |
| 19B | 22½ | 30 | 54 | 24 | 41 | 780 | 12 | 18 | 10 | 1/4 | |
| 19C | 22½ | 30 | 54 | 24 | 41 | 835 | 12 | 18 | 3/16 | 1/4 | |
| 19D | 22½ | 30 | 54 | 24 | 41 | 885 | 12 | 18 | 1/4 | 1/4 | |
| 21A | 27 | 30 | 54 | 30 | 47 | 800 | 12 | 18 | 10 | 1/4 | |
| 21B | 27 | 30 | 54 | 30 | 47 | 875 | 12 | 18 | 3/16 | 1/4 | |
| Light Ton Car | 20 | 30 | 48 | 24 | 41 | 720 | 12 | 18 | 10 | 1/4 | |
| Heavy Ton Car | 20 | 30 | 48 | 24 | 41 | 770 | 12 | 18 | 3/16 | 1/4 | |

NOTE In ordering cars for cages, give exact height and width of cage. Cage cars are made to fit within the steps on the body of the car Unless otherwise specified all cars are built for 18-inch gauge of track, but any gauge will be built to order

# Truax Side Dump Ore Cars

Fitted with Self Oiling Wheels and Malleable Iron Dust Caps, Malleable Iron Hook and Chain to hold the Door open when necessary, Malleable Iron Axle Caps Patent Hinges and Automatic Door. Bottom of Door Re-inforced T Steel. The Patent Rail Grab works automatically and it is impossible for the Car to upset while being dumped. Fitted with two heavy Spiral Springs underneath the body, which take the load when the Car is dumped. After the load is dumped the body of the Car returns automatically to its original Position. Equipped with Draw Heads and Bumper Springs so that they may run in trains if desired.

The Standard **Side Dump Cars** are constructed with heavy wood framework. We can furnish side dump cars with steel framework at a small additional cost.

| Number of Car | Capacity, Cubic Feet | Thickness of steel in sides | Thickness of steel in Bottom | Width of Body, in | Length of Body, in | Height of Body, in | Height From Top of Track, in. | Carrying Weight, Pounds | Diameter of Wheels, in. | Gauge of Track, in | Each |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 25A | 25 | No. 10 | ¼ | 30 | 58 | 24 | 43½ | 1060 | 12 | 18 | .. .. .. |
| 25B | 25 | 3/16 | ¼ | 30 | 58 | 24 | 43½ | 1100 | 12 | 18 | .. ..... |
| 30A | 30 | No. 10 | ¼ | 36 | 58 | 24 | 43½ | 1100 | 12 | 18 | .. . ... |
| 30B | 30 | 3/16 | ¼ | 36 | 58 | 24 | 43½ | 1165 | 12 | 18 | . .. .. |
| 30C | 30 | 3/16 | ⅜ | 36 | 58 | 24 | 43½ | 1250 | 12 | 18 | ..... |
| 35A | 35 | No. 10 | ¼ | 36 | 70 | 24 | 43½ | 1160 | 12 | 18 | . . . . |
| 35B | 35 | 3/16 | ¼ | 36 | 70 | 24 | 43½ | 1200 | 12 | 18 | .. .. |
| 35C | 35 | 3/16 | ⅜ | 36 | 70 | 24 | 43½ | 1290 | 12 | 18 | . ... .. |
| 40A | 40 | 3/16 | ¼ | 36 | 70 | 28 | 47½ | 1250 | 12 | 18 | . .. |
| 40B | 40 | 3/16 | ⅜ | 36 | 70 | 28 | 47½ | 1340 | 12 | 18 | ..... |

Unless otherwise specified, all cars are built for 18-inch gauge of track, but any gauge will be built to order

# STEAM WHISTLES

Fig. 135A

No 1 Plain, Short Bell

Fig. 135E

No 10 Plain Chime

Fig. 135F

No 20 Rev Lever, Chime

Fig. 135B

No. 1¼ Plain, Long Bell

Fig. 135C

No 2 Rev. Lever, Short Bell

Fig 135D

No 2½ Rev Lever, Long Bell

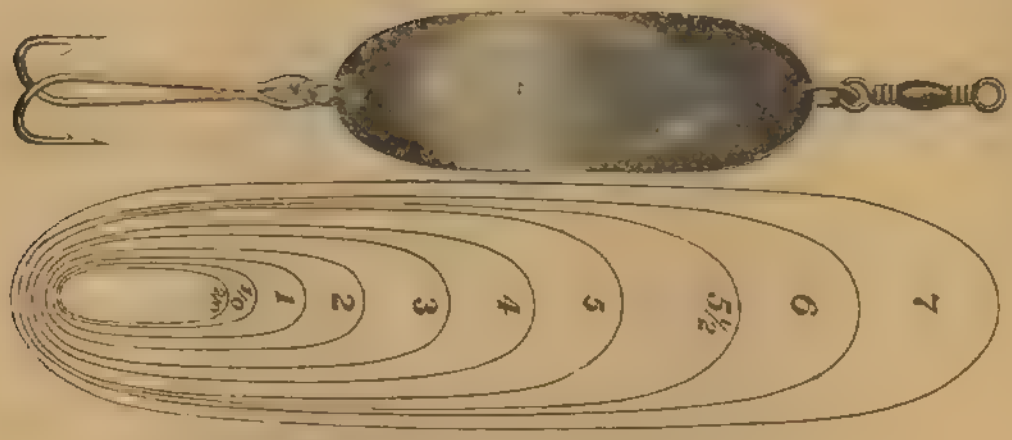
| | Diameter of Bell | In. | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ |
|---|---|---|---|---|---|---|---|---|---|
| No 1 | Plain Short Bell, Metal Base | Ea. | $2 20 | 2 75 | 3 00 | 4 35 | 5 25 | 7 25 | 9 50 |
| | Length of Bell | In | 2 | 2½ | 3 | 3½ | 4 | 5 | 5½ |
| | Size of Pipe | In. | ⅛ | ⅜ | ½ | ¾ | ¾ | 1 | 1 |
| No. 1¼ | Plain, Long Bell, Metal Base | Ea. | 2 50 | 3 25 | 3 50 | 4 85 | 6 00 | 8 00 | 10 50 |
| | Length of Bell | In. | 3 | 3½ | 4 | 4½ | 5½ | 6 | 7 |
| | Size of Pipe | In | ¼ | ⅜ | ½ | ¾ | ¾ | 1 | 1 |
| No. 2 | Rev. Lever, Short Bell, All Metal | Ea. | 3.10 | 3.75 | 4.00 | 5.80 | 6.50 | 8.50 | 11.50 |
| | Length of Bell | In. | 2 | 2½ | 3 | 3½ | 4 | 5 | 5½ |
| | Size of Pipe | In. | ¼ | ⅜ | ½ | ¾ | ¾ | 1 | 1 |
| No. 2½ | Rev. Lever, Long Bell, All Metal | Ea. | 3.40 | 4.25 | 4.50 | 6 00 | 7 25 | 9 25 | 12 25 |
| | Length of Bell | In. | 3 | 3½ | 4 | 4½ | 5½ | 6 | 7 |
| | Size of Pipe | In. | ¼ | ⅜ | ½ | ¾ | ¾ | 1 | 1 |
| No 10 | Plain, Chime, All Metal | Ea | | | | 5 00 | | 7 50 | |
| 20 | Rev. Lever, Chime, All Metal | Ea | | | | 8 00 | | 11 00 | |
| | Size of Pipe | In | | | | ¾ | | 1 | |

| | Diameter of Bell | In. | 4 | 5 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|
| No 1 | Plain, Short Bell, Metal Base | Ea. | $12 00 | 19 00 | 21 00 | 70 00 | 180 00 | 290 00 |
| | Length of Bell | In | 6 | 7 | 9½ | 12 | 18 | 20 |
| | Size of Pipe | In. | 1 | 1¼ | 1½ | 2 | 3 | 3 |
| No 1¼ | Plain, Long Bell, Metal Base | Ea. | 13.00 | 20.00 | 25 50 | 75.00 | 190.00 | 300 00 |
| | Length of Bell | In. | 8 | 11 | 13½ | 16½ | 22 | 24 |
| | Size of Pipe | In. | 1 | 1¼ | 1½ | 2 | 3 | 3 |
| No 2 | Rev. Lever, Short Bell, All Metal | Ea. | 15.00 | 22.50 | 33 00 | 95.00 | | |
| | Length of Bell | In. | 6 | 7 | 9½ | 12 | | |
| | Size of Pipe | In. | 1 | 1¼ | 1½ | 2 | | |
| No 2½ | Rev. Lever, Long Bell, All Metal | Ea. | 16 00 | 23 75 | 34 50 | 100 00 | | |
| | Length of Bell | In. | 8 | 11 | 13½ | 16½ | | |
| | Size of Pipe | In. | 1 | 1¼ | 1½ | 2 | | |
| No. 10 | Plain, Chime, All Metal | Ea. | 15.00 | 28.00 | 42.00 | 70.00 | 190 00 | 280 00 |
| 20 | Rev. Lever, Chime, All Metal | Ea. | 20.00 | 36.00 | 50.00 | 90.00 | 210.00 | 300 00 |
| | Size of Pipe | In. | 1 | 1¼ | 1½ | 2 | 3 | 3 |

Whistle Chimes with any Number or Sizes of Bells will be made to order

# Spoon Bait

STEWART BASS




Finishes—Copper and Nickel, All Nickel, All Copper, All Brass

| Sizes | 00 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| Per doz | $ 3.50 | 3.50 | 3.50 | 4.50 | 5.50 | 8.00 | 9.00 | 13.00 | 18.00 |

# Snake Wood Minnows

PLAIN

Assorted Colors and White Bodies

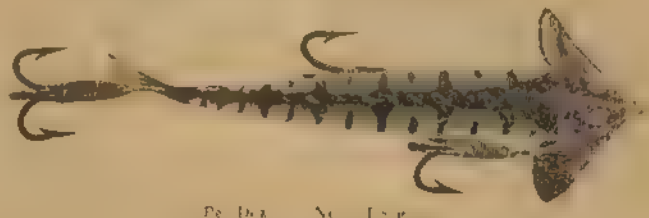
Size of Body 3x⅝ in — Per Doz $7.00

WEEDLESS

Assorted Colors and White Bodies

Size of Body 3x⅝ in — Per Doz $11.00

# Phantom Minnows



| No. | Lengths | Per Doz. | No. | Lengths | Per Doz. |
|---|---|---|---|---|---|
| 1 | 1¾ in. | $ 4.00 | 4 | 2½ in. | $ 4.50 |
| 2 | 2 in. | 4.00 | 5 | 3 in. | 5.00 |
| 3 | 2¼ in. | 4.00 | | | |

Use Fishmaster, Hot Spot or Silver Lure

# Dowagiac Minnows

**No. 51–Artistic Bucktail**

Per Doz.

Regulation Casting, Weight ½ ounce, Extra Weight Attachment, Length 1¾ in., Bright Gold Body, Greenish Back. . . . . $ 9.00

**Nos. 100 to 103A**

Fitted with Two Spinners and Three Heavy, Nickel Plated Treble Hooks, Length of Body 2⅛ in., Weight 14 Pwts., Sinks Rapidly

| No. | Per Doz. | No. | Per Doz. |
|---|---|---|---|
| 100–Fancy Back | $ 9.00 | 102–White | $ 9.00 |
| 101 Rainbow | 9.00 | 105–Yellow | 9.00 |
| 109–Silver-White | 9.00 | 109a–Yellow Perch | 9.00 |

**Nos. 151, 159, 159A**

Fitted with Two Spinners and Five Heavy, Nickel Plate Treble Hooks, Length of Body 3¾ in., Sinks Slowly

| No. | Per Doz. |
|---|---|
| 151–Rainbow | $12 00 |
| 159–Silver-White | 12 00 |
| 159a–Yellow Perch | 12.00 |

Packed One Each in a Wooden Box

# Artificial Bait

FROGGIES

Soft Rubber

Per Doz. . . . . $ 4.00

One-half Doz. on a Card

# Single Bit Axes

## SUNSET BEVELED

Handled

Forged from one piece of Tool Steel, Tempered by a Special Process. Painted Bright Red, with Blue Bevels Handled with No. 2 Selected Hickory Handles.

| | | Per Doz. |
|---|---|---|
| No. 70 Handled | 3 to 4 pounds Assorted | $13.00 |
| | 3½ to 4½ " " | 13.50 |
| | 4 to 5 " " | 14.00 |

## INVINCIBLE

Handled

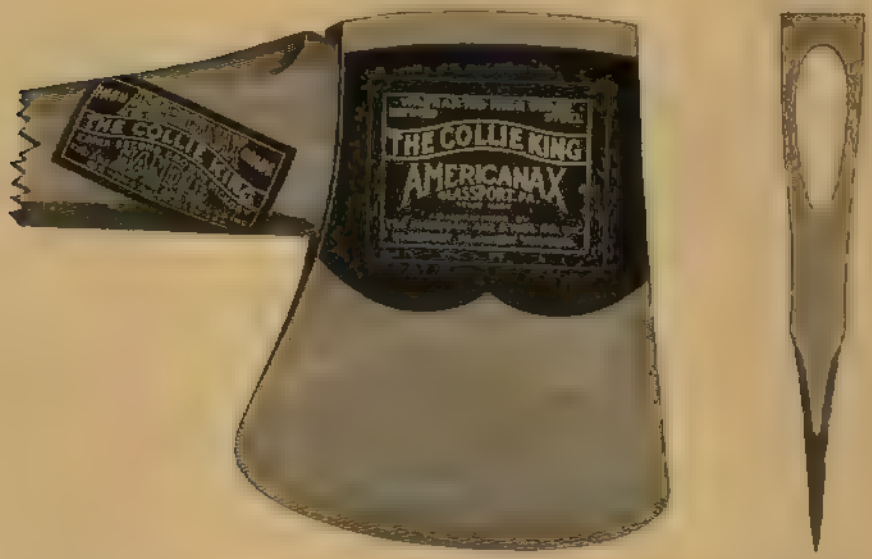
Forged from one piece of Steel. Ebony Finish with Ground Edges Handled with No. 2 Hickory Handles

| | | Per Doz. |
|---|---|---|
| No. 80 Handled | 3 to 4 pounds Assorted | $12.00 |
| | 3½ to 4½ " " | 12 50 |

One Doz. Assorted in a Case with Handles Burlapped

# Single Bit Axes

## COLLIE KING




**Handled**

Elliptical ground concel shaved Blades  Handled with Octagon Second Growth Hickory Handles  Warranted

| | | Per Doz. |
|---|---|---|
| **Collie King Handled** | 3½ lbs | $26.00 |
| | 4 lbs | 26.50 |
| | 4½ lbs | 27.00 |

One half dozen in a box with Handles Burlapped

# Single Bit Axes

SUNSET

California-Ohio Pattern

Wedge Pattern

Gold Bronzed, Polished Head and Bit, Superior Quality Cast Steel

## Unhandled

| California-Ohio Pattern | | Wedge Pattern | |
|---|---|---|---|
| No. | Base Per Doz. | No. | Base Per Doz. |
| 60 | $13.00 | 65 | $13 00 |

## Handled

| California-Ohio Pattern | | | Wedge Pattern | | |
|---|---|---|---|---|---|
| No. | Handles | Base Per Doz. | No. | Handles | Base Per Doz. |
| 60 | A "Q" | $21.00 | 65 | A–"Q" | $21 00 |
| 60 | C Sequoia | 20.00 | 65 | C–Sequoia | 20 00 |
| 60 | E Clinton | 19 00 | 65 | E Clinton | 19 00 |
| 60 | F–Yosemite | 18 00 | 65 | F–Yosemite | 18 00 |
| 60 | G Sunset | 17 00 | 65 | G Sunset | 17 00 |
| 60 | H Comstock | 19 00 | 65 | H Comstock | 19 00 |
| 60 | K–Extra | 18 00 | 65 | K–Extra | 18 00 |
| 60 | L–Excelsior | 17 00 | 65 | L–Excelsior | 17 00 |
| 60 | M–No. 1 | 16.50 | 65 | M–No 1 | 16 50 |
| 60 | N–No. 2 | 16.00 | 65 | N–No. 2 | 16 00 |

Weights 3, 3½, 4, 4½, 5, 5½ and 6 pounds or Assorted 3 to 4, 3½ to 4½, 3½ to 4½ and 4 to 5 pounds

One Doz. to a Case

Weights, Assorted 3½ to 4½ pounds

One Doz. to a Case

For Classification of Advances over Base Prices, See Page 2

# Double Bit Axes

## CLEAN CUT

Falling Pattern

California Reversible Pattern

Youngs Pattern

### CLEAN CUT POLISHED

Full Polished and Etched, Extra Quality Silver Steel—Fully Warranted

**Unhandled**

| No. | | Base Per Doz. |
|---|---|---|
| 11 | California Reversible Pattern | $22 00 |
| 12 | Falling Pattern | 22 00 |
| 13 | Youngs Pattern | 22 00 |
| 14 | Swamping Pattern | 22 00 |

One Dozen in a Case.

### CLEAN CUT SPECIAL

Rustless "Gun Metal" Finish, Deep Gold Filled Etching.
Extra Quality Crucible Cast Steel—Fully Warranted

**Unhandled**

| No. | | Base Per Doz. |
|---|---|---|
| 21 | California Reversible Pattern | $20.00 |
| 22 | Falling Pattern | 20 00 |
| 23 | Youngs Pattern | 20 00 |
| 24 | Swamping Pattern | 20 00 |
| 25 | Humboldt Pattern, | 20 00 |

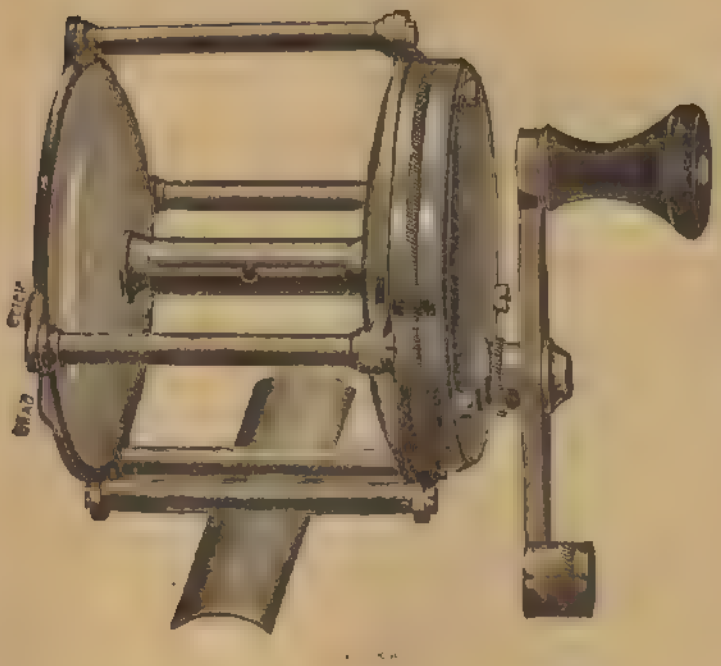
One Dozen in a Case

Weights 3¼, 3½, 3¾, 4 and 4½ pounds or Assorted as desired

**For Classification of Advances over Base Prices, See Page 2**

# Fishing Reels

SURF

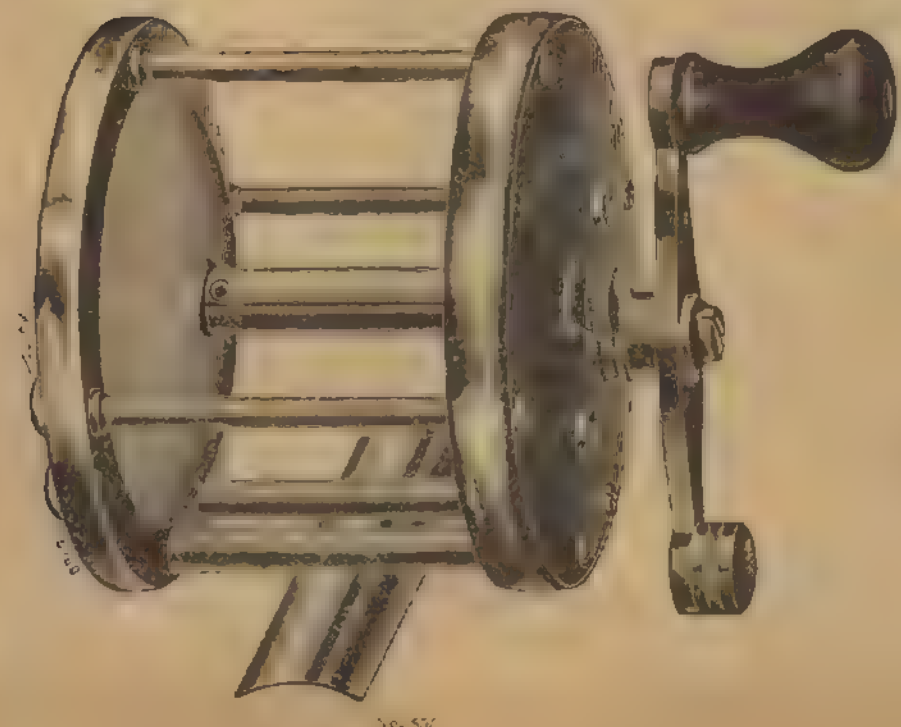


No. 850

Nickel-Plated
Double Multiplying, Metal Cap, Knob Handle

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 150 | 3 in. | $27.00 |
| 200 | 3¼ in. | 30 00 |
| 250 | 3½ in. | 33.00 |
| 300 | 3¾ in. | 36.00 |

One Reel in a Box



No. 855

Nickel Plated
Double Multiplying
Metal Bound Rubber Disks
Oil Cups over Bearings

| Yards | Diam. Disk | Per Doz. |
|---|---|---|
| 150 | 2 ¼ | $18 00 |
| 200 | 3 ⅛ | 31 00 |
| 250 | 3 ⅛ | 31 00 |

# Fishing Reels

No. 2 Gem

No. 1 Gem

**German Silver,** Free Running, Balanced Spool with Adjustable Click, especially adapted to Fly Casting.

| No. | Yards | | Per Doz. |
|---|---|---|---|
| 20N Gem | 80 | | $15 00 |
| 20 GM Gem | 80 | Gun Metal Finish | 15.00 |

**Brass, Nickel Plated,** same Spool as the No 2 Gem, with Seat on Side.

| No. | Yards | | Per Doz. |
|---|---|---|---|
| 10N Gem | 60 | | $7.00 |
| 10GM | 60 | Gun Metal Finish | 7.00 |

Ideal

## IDEAL

**German Silver,** exceedingly free running Spool, Adjustable Click and Drag, large open Spool, which insures the line drying quickly and winding as rapidly as a regular multiplying Reel. Reel is dismounted by simply removing one Screw.

| No. | Yards | | Each |
|---|---|---|---|
| 1 Ideal | 80 | 2¼x1 in. | $2 00 |
| 1GM Ideal | 80 | 2¼x1 in. Gun Metal | 2 00 |
| 2 Ideal | 70 | 3 ¼x1⅜ in. | 2 75 |
| 2GM Ideal | 120 | 3¼x1⅜ in. Gun Metal | 2 75 |

No. 5 Tripart

Tripart

Finished Brass, same as Brass Nickel Plated Reels, except Nos. 5 and Tripart, which are Gun Metal Finish. Spool easily taken apart by unscrewing retaining rings.

| No. | Cap. Yds. | Diam. Spool | | Each |
|---|---|---|---|---|
| 5 | 80 | 1¾ in. | Tripart | $5 00 |

# V V V

# Valentine's Vanadium Varnishes

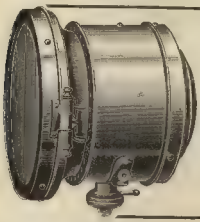
Developed for the needs of the Automobile, its Manufacturers and its Users.
Write to the nearest office for a descriptive price list of Vanadium Varnishes.

**Over 80% of all the Exhibitors at the Automobile Shows of the last four years finished with**

**VALENTINE'S VANADIUM VARNISHES**

## Valentine & Company

NEW YORK CHICAGO BOSTON TORONTO LONDON AMSTERDAM PARIS



**Your dealer can afford to give you the BEST Headlight; insist on having it.**

## The ATLAS

**with its superior ventilation and patent spring catch for the door, is the best Lamp made in the World. Take no other.**

**NEW YORK AUTO LAMP COMPANY**
**68 Clarkon Street, New York**

# AXLE SETS FOR 1910

For cars weighing, empty, 1800 to 2500 pounds, 25 H. P.
We have a variety of designs of this class.
Any of the Bearing equipments of recognized merit.
Rear Axles in the fixed hub, semi-floating, or full floating constructions.
NOW is the time to contract. Write us at once in detail concerning your needs.

## The "Long-Arm" System Company, Cleveland, Ohio

### Triumph Valve Remover

**HERE IT IS IN ACTION**

No waste of time

No broken finger nails. Fits any gasoline engine. Patented April 14, 1908

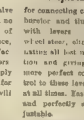
Enables you to remove valve key or valve spring with no side strain or bending of valve stem. List price, $1.00. Discounts to manufacturers, jobbers and dealers. If your dealer cannot supply you, send us P. O. order for $1.00 and the Remover will be sent you postpaid.

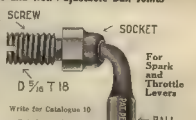
We also manufacture **Grease Cups** and other **Gas Engine Specialties, Screw Machine** and **Punch Press Products,** as well as **Various Lines of Machine Work. Tools, Dies,** etc.

**MECHANICAL AND ELECTRICAL MFG. CO.,**

### Adjustable and Non-Adjustable Ball Joints

for connecting carburetor and timer with levers on wheel steer, eliminating all lost motion and giving a more perfect control to these levers at all times. Easily and perfectly adjustable






Write for Catalogue 10

Cut shows size generally used

List price, steel, 40c each, brass, 50c each
Non-adjustable, as per size of cut, 20c each. Discounts to manufacturers, jobbers and dealers

**R-2227 Prairie Ave., Chicago**

# "JERICHO"

**THE HORN**

**Blown by the Exhaust**

Cannot clog. Requires no cut-out

**4 Sizes: $6, $8, $9, $10**

Booklet 24 on request.

Ask your dealer or send make and model of car to

**The Randall-Faichney Co.**

SOLE MAKERS

BOSTON :: :: U. S. A.

# Accurate Gears

We can furnish all kinds of accurately cut gears, either in quantity, or single orders for repair work.

Let us quote you.

THE

**New Process Raw Hide Co.**

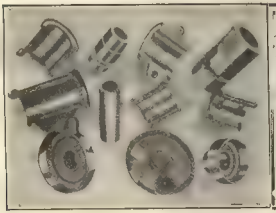
SYRACUSE, N. Y.

**IMPERIAL PORCELAIN SPARKING TUBES**

MANUFACTURED BY

**The Imperial Porcelain Works, Trenton, N. J.**

When desiring quotations always send sample or drawing of style required.



**Finished Metal Castings of Superior Tensile Strength from Superior Alloys**

Thirty Years' Experience in Compounding Alloys

Finished Die Moulded Bearing Bushings for Gasoline Engines our Specialty; also Timer Parts—in fact, everything that you are now using cast from brass. Our Die Castings need no filing, fitting or machining, but are ready for assembly when leaving our factory. Manufactured by our new and improved vacuum process.

**E. B. VanWagner Mfg. Company**

Manufacturers of

Finished Metal Castings of Superior Tensile Strength

SYRACUSE, N. Y.

# Thor

THE

# MOTORCYCLE SUPREME

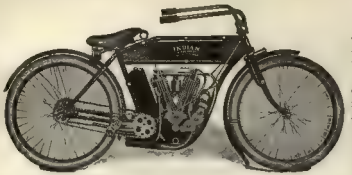
## AURORA AUTOMATIC MACHINERY CO.

Thor Building, 1307 Michigan Ave., CHICAGO, ILL.

## FOR PERMANENT SATISFACTION

Get the Machine with a Real Factory Behind It

# THE INDIAN



Is **NOT** an "assembled" machine, but is made complete in the largest exclusive motocycle factory in the world, equipped with wonderful, special automatic machinery, insuring an accuracy not surpassed in the finest gun work. That's what makes the **INDIAN** so phenomenally powerful, able and reliable.

## Hendee Mfg. Co., Springfield, Mass.

**CHICAGO BRANCH: 1251 Michigan Avenue**

[MEMBERS MOTORCYCLE MANUFACTURERS ASSOCIATION]

# Merkel Motorcycles

as usual

## in the Lead

F. A. M. National Endurance Run -- Cleveland, Ohio, to Indianapolis, Indiana. 7 started, 7 finished. Four Perfect Scores -- 6908 Points out of a possible 7000 -- Making the HIGHEST AVERAGE of 98 Per Cent

**At Brighton Beach, Aug.**— Beats all Competitors.

**At Wildwood, N. J., July**— One mile. 48 1-5 seconds

**At Detroit, Mich., Sept. 2d**— First, 5 mile handicap. Second, 10 mile open. Second, 5 mile open.

**At Rochester, N. Y., Sept. 6th** — First 10 mile open First, 5 mile club championship.

**At Washington, Sept 6th** — First, 1 mile novice 30.50 class. Second, 5 mile open 30.50 class. Third, 15 mile handicap 30 50 class.

**At Lowell Mass., Sept. 10th** - First, 1 mile open 61 class. Second, 20 mile open 49 50 class.

**At Erie, Pa., Aug. 30th**— First, 1 mile. First, 10 mile handicap. Second, 5 mile.

**At Los Angeles, Cal., Sept. 9th** — On one mile dirt track Pearless Balke, 10 miles 9.12 — 5 Dare Head Derkum 5 miles 4 35 3 5

In the majority of events private owners with stock machines, no specials and factory men — but invariably and always **Merkel Ball Bearing Motors** — Speed, Power, Smoothness of Running. **Merkel Spring Frame Forks** — Comfort and Luxurious Riding. Ask any man or

## Merkel-Light Motor Co.

40 Hanover Street
POTTSTOWN, PA.

Standard Motorcycle Pedals

Standard Sager Motorcycle Toe Clips

# Motorcycles Demand The Best Equipment

The majority of makers of high-grade machines have learned by experience that

## Standard Motorcycle Parts

are the most satisfactory. The careful selection of materials and first-class workmanship accounts for the unvarying excellence of the Standard line, which includes

**Standard Pedals; Standard Sager Toe Clips;** a complete line of **Spokes** and **Nipples; Bridgeport** and **Star Pedals;** also **Breech-Block Spark Plugs.**

Particulars cheerfully furnished.

## The Standard Co., Torrington, Conn.

# "The Easiest Riding Car in the World" —and the Factory That Produces It

For over fifty years the product of this factory has enjoyed a world-wide reputation for mechanical excellence.

All the resources of this vast industrial plant are bent to the perfection of the Marmon "Thirty-two." No car is more carefully manufactured to give long and faithful service.

Its silence and smoothness of operation, its superior comfort, and its enduring reliability bear witness to its thoroughness of construction.

The value of the Marmon "Thirty-two" is readily apparent to anyone who knows the kind of design, materials, workmanship and equipment that distinguish a really high-grade car.

## Price, Complete {Touring Car, Suburban or Roadster} $2650

**SPECIFICATIONS**—**Motor,** four cyl., 4½x5, 32-40 H. P., water cooled, with Mercedes type honeycomb radiator. **Ignition,** Imported Bosch H. T. Magneto and battery, dual system. **Lubrication,** Marmon system of automatic force feed through hollow crankshaft. **Drive,** straight line shaft. Selective transmission and floating rear axle one compact unit. Large durable brakes, easy adjustment. **Materials,** absolutely the best of everything, including Krupp, Vanadium and Chrome Nickel steels, Imported Hess-Bright bearings. Schwarz wheels. **Tires,** 34x4, Q. D. Marsh Rims. **Wheel Base,** 116 inches. Weight (Touring Car), 2300 lbs. **Bodies,** all metal, cast aluminum base with cast aluminum doors and door frames. **Equipment,** complete and highest grade.

*DEALERS who wish to figure on an agency for the best, moderate-priced, high-class car, should write us at once.*
*Promised deliveries easily made good.*

**Nordyke & Marmon Co.** (Estab. 1851) **Indianapolis, Ind.**
*Standard Mfrs., A. M. C. M. A.*

# Matheson

# Two More Perfect Scores

**Won by two 1910 Model Matheson Six-Cylinder 50 H. P. Shaft Drive, $3000 Cars**

in Binghamton, N. Y., to Boston, Mass., and return **800 Miles Contest,** June 21-26, over mountain roads.

**Do you know of any other make of car that has won so many consecutive victories?**

## OTHER RECENT VICTORIES

### FIRST AND SECOND

In Washington-Hagerstown, 168 Miles, Sealed Bonnet Contest, May 15, 1909, winning Washington Post Cup, against a field of 18 contestants.

### PERFECT TIME AND ROAD SCORES

IN NORRISTOWN-HAGERSTOWN 400 Miles Endurance Contest, May 18-19, 1909, against a field of 32 contestants.

### TWO MORE PERFECT SCORES

IN NEW YORK-BOSTON 247 Miles Endurance Contest, March 11, 1909, against a field of 20 contestants.

### FIRST, SECOND AND THIRD TIME PLACES

IN PHILADELPHIA-WILKES-BARRE 300 miles Mid-Winter Contest, against a field of 32 contestants, January 1-2, 1909, only three of the 32 cars had perfect scores, and

### THOSE THREE WERE "MATHESONS"

THE CONCLUSION—The Matheson Car has proved in every contest it has entered that it is far and away the most reliable and serviceable as well as the most economical and the fastest touring car in the world.

50 H. P. Six Cylinder Shaft Drive . . . . . **$3,000**
Equipped with choice of Touring, Tourabout, Toy Tonneau, Close Coupled or Runabout Bodies.

50 H. P. Four Cylinder Chain Drive . . . . . **5,000**
Equipped with Touring Body.

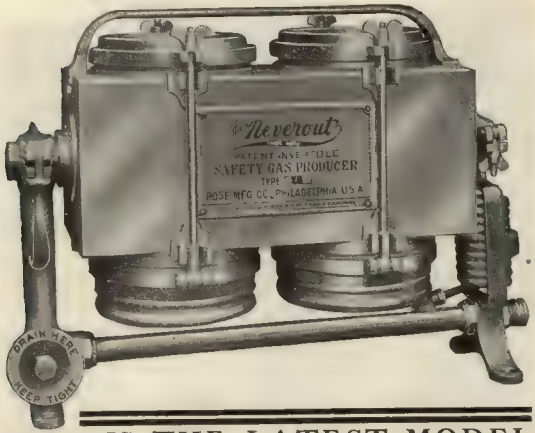
Limousine or Landaulet . . . . . **5,750**

Roadster or Tourabout . . . . . **4,750**

## MATHESON AUTOMOBILE COMPANY

FACTORY: WILKES-BARRE, PENNSYLVANIA

**Main Sales Office, 1886-1888 BROADWAY, NEW YORK CITY**




# THIS IS THE LATEST MODEL OF THE FAMOUS

# Neverout

TRADE MARK

## Patent Invertible System of Gas Generation

for lighting automobiles and motor boats. It stands absolutely in a class by itself and has overcome the trouble with common, so-called generators Lights instantly and can be repeatedly relighted after standing for long periods of time, as the carbide is separated from the moist ashes by the invertible method.

¶ This system is the only correct system and is now being used by the United States Government on the Isthmian Canal, as well as the most expert and most careful automobilists throughout this country and Europe.

¶ The Neverout contains a new patent system of cooling and purification, thereby delivering to the lamp burners pure acetylene gas, which burn at the highest known brilliancy. Moisture is entirely eliminated when gas reaches the burners, thereby insuring the life of the burners to an indefinite period—a point of economy which cannot be overlooked.

¶ Write for free catalog, also describing the Neverout Double Focus Searchlights, twice as powerful as the old-fashioned kind.

¶ *The Neverout Double Focus Searchlights are the only automobile searchlights which are steady and unwavering under all conditions.*

## ROSE MANUFACTURING CO.

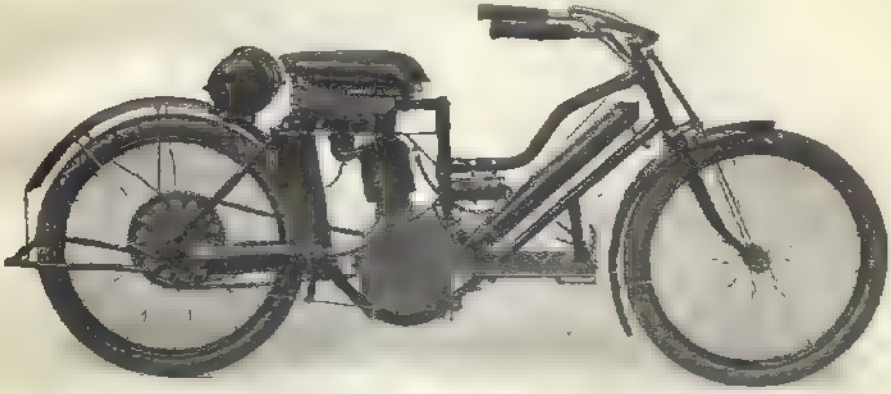
**911 Arch Street :: :: :: Philadelphia, U. S. A.**

# 1909

# The New Era Auto-Cycle

## Will Revolutionize the Motor-Cycle Business

The sweeping improvements found in the New Era Auto-Cycle are a revelation to the trade.



Patent Pending

## TEN GOOD FEATURES

**No Pedals, 60-inch Wheel Base, No Vibration, Form Seat, Hand Cranked Motor, Absence of Noise, Foot Board, Two Speed Transmission, Internal Expanding Brake, Free Motor.**

## DEALERS ENTHUSIASTIC

At the New York, Chicago and Boston Shows Motor-Cycle dealers predicted a quick sale for our 1909 product. Only a limited number of agencies can be taken on this season, and territory still open will be allotted to those best able to represent us.

Write for catalogue and proposition.

## The New Era Gas Engine Company

### 7 Dale Ave., Dayton, Ohio

line adjustment brought up on the tank in easy reach, so as to be instantly adjustable. I think if Mr. Ide made a new vaporizer valve and made it very light with an adjustable spring behind it he would get good results. Also fit a needle valve to the gasoline intake to vaporizor with a very fine adjustment. In conclusion I would say that I have been riding 2-cycle motorcycles for the last six years and have found them absolutely reliable in every way. I would never go back to the 4-cycle on any account. I have never been stuck on the road or towed home. I certainly think that the 2-cycle motorcycle is the coming thing when people get educated to it.

ALAMEDA, CAL. A. N. RAMSAY.

---

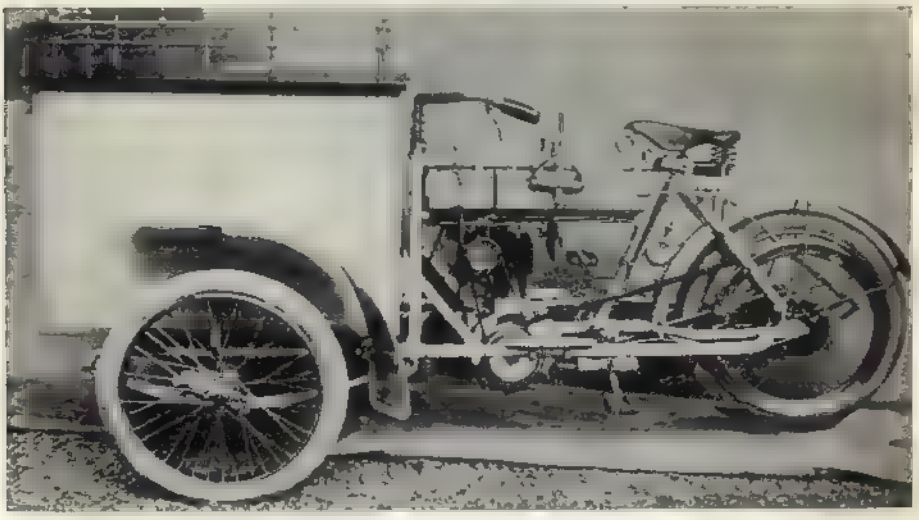
## THE "N. S. U." DELIVERY TRI-CAR

The "N. S. U." delivery tri-car illustrated herewith is imported by the N. S. U. Motor Company, 206 West Seventy-sixth Street, New York City. This vehicle is suitable for all kinds of light delivery work. The tri-car is made in 4 and 6 H. P. models, the 4 H. P. size being illustrated and described herewith.

The motor is of single cylinder type, 3 7-32 inches bore by 4⅛ inches stroke. The valves are mechanically operated. The crank shaft is of the built-up type, consisting of two fly wheels, each keyed on a short shaft, the two being connected by a pin which forms the crank pin. The left hand shaft projects through the crank case and is fitted with a grooved pulley to take the driving belt. The other shaft is fitted with a gear which drives the cam shaft gear. The motor is provided with a fan to assist in cooling.

Lubrication is by the splash system. The carburetor is of the float feed type. Two rotary air shutters are fitted to the mixing chamber and may be adjusted by the rider while in the saddle. The throttle consists of a long tube with an aperture at its upper end, and a special aperture near its lower end, which end fits into a prolongation of the mixing chamber body. This lower aperture allows communication between the mixing chamber and the manifold, and acts as the throttle proper. A handle operates the throttle tube by a backward and forward movement, the operation of this handle not affecting the adjustment of the auxiliary air.

Ignition is by an Eisemann high tension magneto which is driven by a gear train housed in a special casing and runs in oil. The frame is of cold drawn seamless steel tubing. Drive is by V belt. The two speed gear in the hub is of the planetary type and combines high and low gear drums, and internal expanding and contracting band brakes. The high and low gears are operated respectively by the forward and backward movement of a hand lever over a notched quadrant which contracts the required band by a system of levers. Intermediate position of the lever gives a free engine. The external contracting brake is operated by back pedaling and the internal expanding brake by Bowden wire from a lever on the right handle bar. A two gallon gasoline tank and a two pint oil tank are provided. The oil tank and the spark coil are housed in one casing. The wheel base is 74 inches. The box shown in the illustration is built for a load of 450 pounds. A railing is provided on top for holding additional articles. 26x2½-inch tires are fitted on all three wheels. The 6 H. P. model uses a twin cylinder motor 3-inch bore by 3½-inch stroke. The carrying capacity is 600 lbs. All other specifications are the same as for the single cylinder model.



The "N. S. U." 4 H. P. Delivery Tricar

# Pullman AUTOMOBILES

"Not only the best at the price;
But the best at any price."

| | | | | | |
|---|---|---|---|---|---|
| Model L, 20 H. P. Runabout, | $1500 | | Model 6-30, Light Speed Car, | $2500 |
| " L, 20 " Toy Tonneau, | 1600 | | " 4-40, Roadster, | 3000 |
| " K, 30 " " " | 2000 | | " M, Touring Car, | 3500 |
| " K, 30 " Touring Car, | 2000 | | " M, Toy Tonneau, | 3500 |

Once "PULLMAN" always "PULLMAN"

**YORK MOTOR CAR CO., Inc., York, Pa.**

# THE PERFECT ELECTRIC COUPE

Perfect in every department—as cosy and luxurious as any woman would have it—as able and efficient as any man would demand it to be.

Nothing is skimped in this car.

It is by far the handsomest coupe on the market to-day

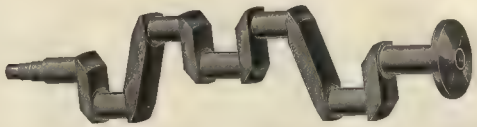
Write for our catalog describing mechanical features that will at once convince you that it's the soundest and strongest car of its kind in America.

See if you know of a car half so good.

Any of the following agents will be pleased to demonstrate.

**THE RAUCH & LANG CARRIAGE CO.** Dept D, 629 Superior Ave., Cleveland, O
55 YEARS' EXPERIENCE BUILDING FINE CARRIAGES

CHICAGO, ILL.—C. P. Kimball & Co., 315 Michigan Ave.
DETROIT, MICH.—Wm P Neumann & Co., 1341 Woodward Ave.
ST LOUIS, MO Union Electric Light & Power Co.
TOLEDO OHIO.—Toledo Motor Car Co.
DAVENPORT IOWA—Mason Carriage Co.
MANCHESTER, N. H. Jas. A. Wellman, Pembroke Bldg.
ERIE, PA.—A. H. Murphy 918 State St.
OMAHA, NEBR.—Electric Garage Company
PHILADELPHIA, PA.—Bergdoll Motor Car Company
LIMA, OHIO.—Wm. E. Rudy.
BUFFALO, N Y Brown Motor Car Co
GRAND RAPIDS, MICH Lubeck Automobile Co.
OKLAHOMA CITY, OKLA.—A. F. Binns.
CANTON, OHIO.—Diebold Motor Car Co
DENVER, COLO.—Colburn Auto Co., 18th and Colfax Ave.
KANSAS CITY, MO. Fletcher Cowherd Jr., Auto Co.
BALTIMORE, MD.—Rice's Garage, North and Madison Aves.
ST PAUL, MINN. Ramaley Auto Garage, 650 Grand Ave
ROCHESTER, N Y—Arthur McNall, South Union and Court Sts.
GOSHEN IND. Goshen Auto Co.
MARIETTA, OHIO.—H B. Coen 25 St Clair Building.
SPRINGFIELD, ILL.—R. Haas Elec. Co., 305-307 E Monroe St.
ATLANTA, GA.—M. Rich
CINCINNATI, OHIO Herschede Motor Car Company
FT WAYNE, IND.—Ohnhaus Automobile Co.
PITTSBURG PA.—M Cie Motor Car Co.
LAFAYETTE, IND Auto Inn.



¶ Something more than a blue-print, a piece of steel and the necessary machinery is required in the making of crankshafts—and that is EXPERIENCE. ¶ We have had plenty of this in our lengthy career, and we give you the benefit of it in every crankshaft we make for you. We use only the best material obtainable; we follow your blue-prints and specifications with absolute fidelity, and the result is crankshaft satisfaction not to be obtained elsewhere. ¶ May we have the pleasure of estimating?

**STANDARD CONNECTING ROD CO.**
**BEAVER FALLS, PA.**

**The Beginning of the End of Prices Higher Than $2500**

**The 1910 Speedwell "50" Touring Car, $2500**

**Also at the same price, Standard and Semi-Racer Roadsters, Baby Tonneau and Close-Coupled Bodies. 50 H. P., 4 Cylinder. 121-Inch Wheel Base**

¶ "Some day," you have said, "we will be able to buy for $2500 the finest car made." You were right. The dawn of that day is here; and your prediction is about to be verified. The progressive experience of the industry for the past ten years culminates now in the **SPEEDWELL**—the car whose coming you foresaw

*Owners of Cars Costing More, Send for SPEEDWELL Literature*

**THE SPEEDWELL MOTOR CAR COMPANY, DAYTON, OHIO**

# The SEELEY HIGH FREQUENCY IGNITION SYSTEM

*"THE COIL WITHOUT VIBRATORS"*

Sold under an absolute guarantee for five years—not to burn out or break down from any cause, except external injury—nor to miss fire from any fault of the coil.

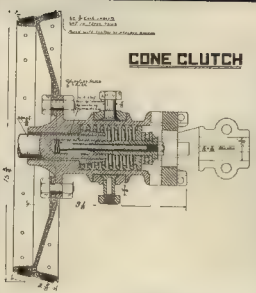
You'll never know perfect "timing" and perfect "ignition" how smoothly your car can run, how much power it can develop, how quickly it can be handled, how little fuel it should consume and how easy it is to overcome ignition troubles, until you install the Seeley System.

*Descriptive Catalogue—fully illustrated—mailed free, if you mention "Cycle & Automobile Trade Journal."*

**HIGH FREQUENCY IGNITION COIL CO.**

We have something of interest to any to dealers.

2307 Main St., LOS ANGELES, CALIFORNIA



CONE CLUTCH

# QUALITY CONE CLUTCHES

that conform to all standard motors, especially the Rutenber and the Continental.

Furnished equipped with Cork Inserts if desired, and with either leather or bronze facing. Thousands in use. They have stood the test.

## Muncie Clutch & Gear Co.

**Office: 433 The Johnson**

**MUNCIE, INDIANA, U. S. A.**

# Money Drawers

| No | | Per Doz. |
|---|---|---|
| 2–Tuckers Alarm Till | | $36 00 |

One-half Doz. in a Crate

# American Bolt and Screw Cases

| No | | Each |
|---|---|---|
| *1–Bolt Case–60 in. High, 30 in. Wide, 98 Drawers | Shipping Weight 580 pounds | $43.50 |
| *2–Bolt Case–65 in. High, 30 in. Wide, 104 Drawers | Shipping Weight 600 pounds | 47.50 |

| No. | | Each |
|---|---|---|
| *1 Screw Case–72 Drawers, 33 in. High, 21 in. Wide | Shipping Weight, 130 pounds | $22.00 |
| *2–Screw Case–80 Drawers, 36 in. High, 21 in. Wide | Shipping Weight, 130 pounds | 25 00 |
| *3–Screw Case–88 Drawers, 39 in. High, 24 in. Wide | Shipping Weight, 135 pounds | 27.50 |
| *4–Screw Case–96 Drawers, 42 in. High, 24 in. Wide | Shipping Weight, 135 pounds | 30.50 |

Shipped from Factory at Dayton, Ohio

*Bolt and Screw Cases not Carried in Stock

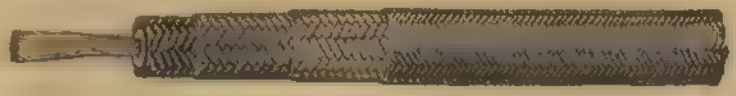
# Automobile Cable

### Primary

Made of Flexible Copper Strand, Rubber Insulated and covered with Varnished Oil Resisting Braid.

| No. | | Per 100 ft. |
|---|---|---|
| 1908 | —Primary Automobile Cable | $ 7 00 |

### Secondary



Made of Flexible Copper Strand, Triple Core Rubber Insulation and Covered with Varnished Oil Resisting Braid.

| No. | | Per 100 ft. |
|---|---|---|
| 1907 | —Secondary Automobile Cable | $20 00 |

# Blasting Machines

### UNITED STATES STANDARD

| No. | | Each |
|---|---|---|
| 3US | —Will Fire 1 to 20 holes | $ 0 00 |
| 4US | —Will Fire 40 to 50 holes | 60 00 |

### PULL-UP

| No. | | Each |
|---|---|---|
| 3PU | —Will Fire 20 to 30 holes | $ 0 00 |
| 4PU | —Will Fire 40 to 50 holes | 0 00 |
| 5PU | —Will Fire 75 to 100 holes | 00 00 |

The above machines are the strongest and most powerful ever made for Electric Blasting. They are especially adapted for submarine blasting, large railroad quarrying and mining work.

### ELECTRIC FUZES

| Length of Wires Feet | Single Strength Ordinary Quality, Per 100 | Double Strength Extra Quality Per 100 | Length of Wires Feet | Single Strength Ordinary Quality Per 100 | Double Strength Extra Quality Per 100 |
|---|---|---|---|---|---|
| 4 | $6 00 | $7 00 | 18 | $13 56 | $14 56 |
| 6 | 7 08 | 8 08 | 20 | 14 64 | 15 64 |
| 8 | 8 16 | 9 16 | 22 | 16 64 | 17 64 |
| 10 | 9 24 | 10 24 | 24 | 18 64 | 19 64 |
| 12 | 10 32 | 11 32 | 26 | 20 64 | 21 64 |
| 14 | 11 40 | 12 40 | 28 | 22 64 | 23 64 |
| 16 | 12 48 | 13 48 | 30 | 24 64 | 25 64 |

In ordering, specify strength and length desired. Longer lengths made to order.

# Ignition Supplies

## SPARK PLUGS

"Delta"

"De Mun"

| Size | | Each |
|---|---|---|
| ½ in., Porcelain, Standard Thread | | $ 0 85 |
| ½ in., Solid Mica, Standard Thread | | $ 1 25 |

## BATTERY SWITCHES

Composition Base

No. 3

No. 5

No. 4

Black Fibre Base

No. 7 Plain Handle

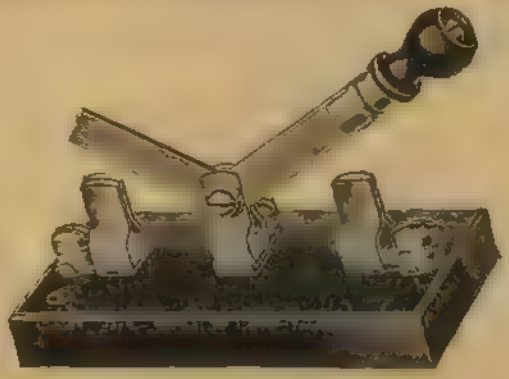
No. 7 Hard Rubber Handle

No. 8 Fan Handle

| No. | | With Plain Fibre Handle Each | With Hard Rubber Handle Each |
|---|---|---|---|
| 3 | —Single Pole, Single Throw | $ 0 20 | $ 0 22 |
| 4 | —Single Pole, Double Throw | 50 | 52 |
| 5 | —Single Pole, Double Throw | 30 | 32 |
| 7 | —Single Pole, Single Throw | $ 0 20 | $ 0 22 |
| 8 | —Single Pole, Double Throw | 32 | 34 |
| 9 | —Double Pole, Single Throw | | 42 |

## GAS ENGINE SWITCH

Specially designed for Gas Engine work for changing from one set of Batteries to another or from Batteries to Sparking Dynamo.



| No. | | Std. Pkg. | Each |
|---|---|---|---|
| 980 | Mounted on Slate Base, 2 x 4 in. | 50 | $ 0 70 |

# Universal Denatured Alcohol Stoves

No. 1

No. 2

**DESCRIPTION**

ALCOHOL RESERVOIRS—Brass heavily nickel plated.
FRAME—Wrought iron (very strong) japanned.
DIMENSIONS—**No. 1** Height 7 inches. Width, 8 inches.
GRATES—Cast iron, nickel plated, dull finish.
CAPACITY OF ALCOHOL RESERVOIR—3 pints.
**No. 2** Height 6¼ inches. Breadth, 13¾ inches; Length, 21½ inches.

Burns with the large blow flame—blue and intensely hot. The combustion is perfect, therefore the flame is absolutely clean, and the consumption of alcohol is reduced to a minimum.

A quart of water of 50 degrees Fahrenheit may be boiled on one of these burners in six minutes.

The compactness and great heating capacity of this stove, and its economy in the use of alcohol make it especially desirable on yachts, in camping outfits and in summer cottages where a clean, safe and powerful stove is necessary. Being quite large, the alcohol reservoirs do not require frequent filling.

It is as easily lighted as a gas stove—two or three strokes of the little pump and the momentary application of a lighted match only being necessary. Is quite easily regulated to any degree of heat required.

**No. 1**—For all General Household Purposes Requiring a Small, Convenient and Effective Heating Apparatus. Three in a wooden box. Weight, per case, 22½ lbs..... Each $ 4 50

**No. 2**—Fills all Kitchen and Laundry Requirements. A thoroughly Reliable, Safe and Convenient Cook Stove. Easily accommodates a large Standard Size (Two Burner) Bake Oven. One in wooden box. Weight 25 lbs..... Each $10.00

**Use Denatured Alcohol.** It is a safe fuel. The fumes which come from an open vessel of denatured alcohol cannot even be lighted. A lighted match must be touched to the liquid itself. It cannot explode. Denatured alcohol is not only safe but is economical as well. It is being produced in such quantities now that it can be bought almost anywhere around sixty cents per gallon, and the price will no doubt continue to be further reduced. Denatured alcohol is so far superior to kerosene and gasoline that they may not be compared. Alcohol is colorless, smokeless, sootless, clean, safe and economical.

# Perfection Smokeless Oil Heaters

**ARE SMOKELESS AND ODORLESS**

Do not smoke because they are equipped with a patented burner so adjusted that the wick cannot be turned up to the smoking point. The spreader locks automatically on the inside of the tube by slightly turning the spreader from left to right it may be easily detached to allow cleaning and wiping the top of the wick. To replace it, drop the spreader back into place when it locks automatically without adjustment.

**Nos. 120 and 220.**

**Nos. 160 and 260**

| No. | | Each |
|---|---|---|
| 120 | Steel Fount. Capacity 3 quarts takes No. 3 Perfection Wick. Height (bail down) 23 in. Weight Crated. 14 lbs. Black Sheet Steel. Nickel Trimmings | $ 5.75 |
| 160 | **Brass Fount. Capacity 4 quarts. takes No. 3 Perfection Wick.** Height (bail down) 25 in. Weight Crated, 20 lbs. Black Sheet Steel. Nickel Trimmings | 8.00 |
| 220 | Steel Fount. Capacity 3 quarts takes No. 3 Perfection Wick. Height (bail down) 23 in. Weight Crated, 14 lbs. Blue Enameled Steel. Nickel Trimmings | 7.00 |
| 260 | Brass Fount. Capacity 4 quarts takes No. 3 Perfection Wick. Height (bail down) 25 in. Weight Crated, 20 lbs. Blue Enameled Steel. Nickel Trimmings | 9.00 |

Packed one in a crate

# Hammers

## ROBERTSONS MAGNETIC HORSESHOE

Cut showing full size of 5 oz. Head

**Tack**

Cast Steel Head, Full Polished, 12 in Handles

| No. | Per Doz. |
|---|---|
| 412 | $ 9 00 |

One Doz. in a Box

**Bill Posters**

Hammer Head and Handle Trimmings Nickel Plated, with Spring for Holding Card for First Tack

| No. | Per Doz. |
|---|---|
| 502–36 in. Jointed Handle in Two 18-in. Sections | $42.00 |
| 503–45 in. Jointed Handle in Three 15-in. Sections | $54.00 |

One sixth Doz. in a Box

## UPHOLSTERERS

Solid Cast Steel, Faces assorted from ¼ to ⅜ inch

Solid Cast Steel, Faces Assorted from ⅜ to ⅝ inch

| No. | Per Doz. |
|---|---|
| 122 | $ 9.00 |
| 123 | $18.00 |

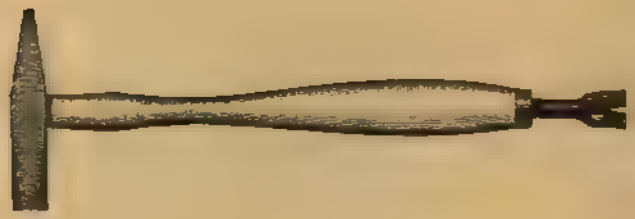
One half Doz. in a Box

**French Pattern**

| No | Per Doz. |
|---|---|
| 124–Solid Cast Steel, Size of Face ⅝ in | $12.00 |

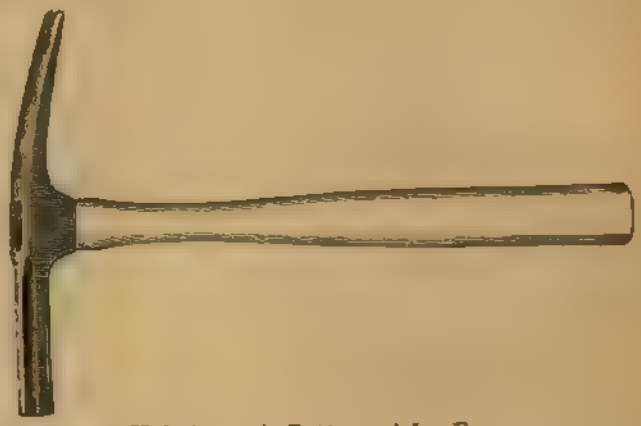
One half Doz. in a Box

# Tack Hammers



Polished, with Claw

| No. | Per Doz. |
|---|---|
| 25– | $ 1.25 |



Upholsterer's Pattern, Adze Eye

| No. | Per Doz. |
|---|---|
| 34–Cast Iron, Nickel Plated | $ 2.00 |
| 650–Cast Steel, Polished | 4.00 |

One Doz. in a Box

Magnetic

| No. | Per Doz. |
|---|---|
| 1–Small, Claw on Head | $ 1.75 |
| 2–Med., Claw on Handle | 2.00 |

| No. | Per Doz. |
|---|---|
| 12–Malleable Iron | $ 1.75 |

One Doz. in a Box

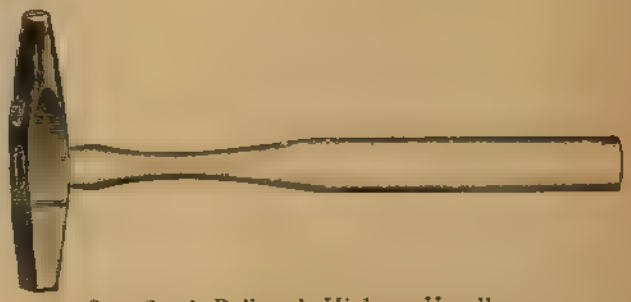
| No. | Per Doz. |
|---|---|
| 4–Malleable Iron, Inlaid Handle, Hardened Face | $ 3.50 |

One Doz. in a Box

HORSESHOE MAGNET

Cast Steel, Polished, Hickory Handle

| No. | Per Doz. |
|---|---|
| 271–4 oz. head | $ 4.00 |



Cast Steel, Polished, Hickory Handle

| No. | Per Doz |
|---|---|
| 272–5 oz. head | $ 5.00 |
| 275–8 oz. head | 7.50 |

One Doz. in a Box

## THE OIL FOR EVERY CAR

The cost of maintaining your automobile and the amount of service it gives you depends to a great extent on the proper oil. No matter what the make of your car its type or its case the right grade of Vacuum MOBILOIL will give perfect lubrication at all times and under all conditions

VACUUM

# MOBILOIL

is made in six different grades. One of these grades is prepared especially for the perfect lubrication of your car. By the use of this one grade you will save time and trouble and avoid expensive experiment

*Send for booklet listing every automobile made and the grade of MOBILOIL prepared for it. Thereafter you need only watch the label on the can, the car will take care of itself. The book is free. Its facts on the science of lubrication are invaluable. Gives track records to date, and other potent motor pointers*

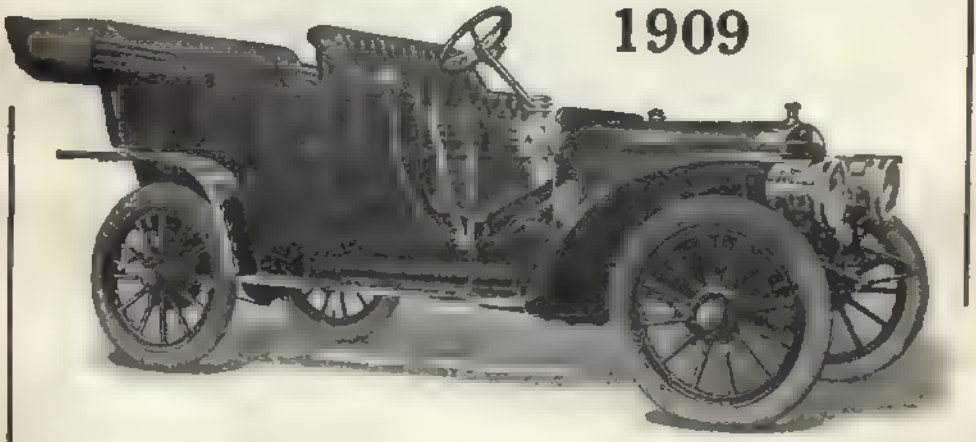
MOBILOIL, in barrels and in cans with patent pouring spout, is sold by dealers everywhere.

MANUFACTURED BY

**VACUUM OIL CO., Rochester, N. Y.**

# Dorris

## 1909



**3-Point Suspension** **Valves in Head**

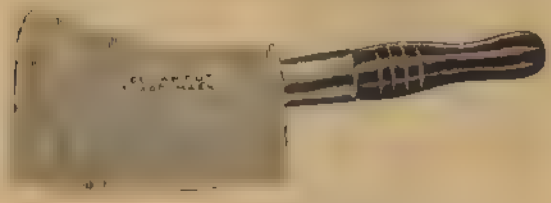
## Price, $2,500

**DORRIS MOTOR CAR CO. :: :: ST. LOUIS, MO.**

# Choppers and Cleavers

Clean Cut

## KITCHEN CHOPPERS



**Clean Cut**

Extra Quality Cast Steel, Tempered, Applewood Handle, Heavy Steel Ferrule, 6 in. Blade—Fully Warranted

| | Per Doz |
|---|---|
| Clean Cut | $12.00 |

One-half Doz. in a Box

## HOUSEHOLD CLEAVERS

**No. BB 6**

Cast Steel Blade, Oil Tempered, Waterproof Rubber finished Handle, Blade 6¼ in. Long, 3 in. Wide

| No. | Per Doz. |
|---|---|
| BB 6– | $ 5.00 |

One Doz. in a Box

## HOUSE CLEAVERS

**Village Blacksmith**

Hand Forged from one piece of Solid Steel, Black Walnut Handle, Brass Rivets—Fully Warranted

| No. | Size Cut | Per Doz. |
|---|---|---|
| 23–6 | in | $16.00 |
| 33–7½ | in | 18.00 |

One Doz. in a Box

## PORK CLEAVERS

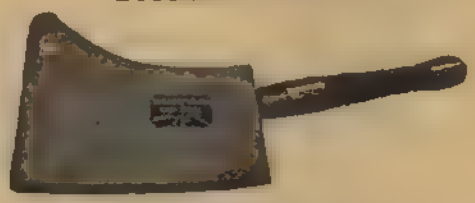
**Village Blacksmith**

Hand Forged from one piece of Solid Steel, Hardwood Handle—Fully Warranted

| Size Cut | Length Handle | Per Doz |
|---|---|---|
| 7 in. | 6 in | $25 10 |
| 8 in. | 7 in | 27 30 |
| 9 in. | 7 in. | 30 00 |
| 10 in. | 7 in | 32 90 |
| Beattys–9 in. Pork Cleavers | | 30 00 |

One Doz. in a Wooden Box

## BUTCHERS CHOPPERS



**Original Wm. Beatty & Sons**

Heavy Steel Blades, Varnished Hickory Handles

| No. | Size Cut | Per Doz. |
|---|---|---|
| 28– | 6 in | $10.00 |
| 29– | 7 in | 11.50 |
| 30– | 8 in | 13.50 |
| 31– | 9 in | 15 00 |
| 32– | 10 in | 16.50 |
| 35 | 11 in | 18 00 |

One-half Doz. in a Wooden Box

## BUTCHERS CLEAVERS

**Original Wm. Beatty & Sons**

Extra Heavy Steel Blades, Varnished Hickory Handles

| No. | Size Cut | Per Doz. |
|---|---|---|
| 9 | 6 in. | $12.00 |
| 10 | 7 in | 14.00 |
| 11 | 8 in | 16.50 |
| 12 | 9 in | 19 00 |
| 13 | 10 in | 21 50 |
| 14 | 11 in | 24.00 |
| 15 | 12 in | 27.00 |

One-half Doz. in a Wooden Box

**Every Day Staple Sellers From Our**

# DOLL DEPARTMENT

**A very excellent line of dolls in demand from January to December. Dolls will break and some little girl reaches the "doll age" every day. Only a house which is headquarters for dolls can name such interesting prices as we quote here. They clearly reflect the advantages to you of our house buying and catalogue selling.**

## "PENNY" SOLID CHINA DOLLS.

All the popular sellers.

1F4002 1F4004 1F4006 1F4008 1F4010

**1F4000** Bisque "coke" babies. For putting in birthday cakes also for favors, parcels, packages, etc. 1 in. painted features, red blonde and brunette hair. 1 doz. in box.....Doz. 44c

1½ in. 1 gro. in box.....Gro. 84c.

**1F4006**—Solid bisque, well made, braid of hair, 3 in. 1 gro. in box.....Gro. 98c

**1F4008**—Glazed china, 3 in.....Gro. 98c

**1F4010**—Good grade, 3½ in. unglazed bisque finish, painted features, 1 doz. in box.....Doz. 92c

## SOLID CHINA AND BISQUE DOLLS.

1F4034-45 F4035-40 F4046-47 F4054-46

**Glazed Solid China Dolls**—Good quality, free from arms and legs, painted features. 1 doz. in box. **1F4034** 1½ in. Doz. **27c** | 1F4035, 4½ in. Doz. **37c**

**1F4038** 2¼ in. Doz. **15c** | 1F4042-4½ in. Doz. **40c**
**1F4040** 3 " " **27c** | 1F4043-5½ " " **78c**

**Glazed Solid China Nerro Dolls**—All glazed, made commonly sold. Free arms and legs. 1 doz. in box.....Doz. **27c**

**Bisque Glazed Flesh Tinted Dolls**—Jointed features shoes and stockings. Joint... Doz. **40c**

1F4065, 3½ in., 1 doz. in box. Doz. **30c**

...Doz. **75c**

**1F4070 Full Jointed Bisque Doll**—Flesh finish, jointed arms and stout body, painted curly features, shoes and stockings, ½ doz. in box.....Doz. **78c**

...Doz. **42c**

...sleep ing glass eyes, jointed arms and legs, painted shoes and ... 1 in box 1 doz. in pkg.....Doz. **84c**

## SOLID CHINA AND BISQUE DOLLS with Real Dresses.

1F4100 1F4102 1F4104 1F4106

**1F4100**—China bonnets, jointed arms, painted ...our dress 3 in. 1 doz. served in box. Doz. **35c**

**F4104**—4½ in., jointed arms, painted shoes ...Doz. **36c**

...bisque dolls, crocheted dresses, sacque collars with collar, jointed arms and legs, painted shoes and stockings. Long flowing hair with ribbon. 1 doz. in spaced box. Doz. **41c**

**F4110** 4½ in., flesh tinted, glass eyes, shoes. Each with hood. ½ doz. in spaced box. 1 doz. in pkg. Doz. **72c**

## DRESSED PATENT WASHABLES.

**1F4432**—9½ in., a great big doll to retail at 5c. Black glass eyes, ...wing hair. 2 styles of inch ...ramed dresses. 1 doz. in box. ...Doz. **42c**

**1F4434**—12 in., as above. ½ doz. in box. Doz. **90c**

## DOLL HEADS.

Our Standard "Pet Name" China Doll Heads. Sold ...

...ches in the ...olds a ...

...1 in box. Doz. **$0 36**
...61
...70
1F3908—4½x3¾ in. " " .75
1F3908—4½x3¾ " " .89

Patent Wash-able Heads—Glass eyes, good ...air, ¾ bangs and ½ ...

1F3... ...d. 1 in box. Doz. **42c**

1F3024—4½x3¾. Bet... ...$1 70

Improved Bisque Heads With Hair ...

flowing hair, ½ light and ½ dark in pkg. 1F3028—4½x3¾ 1 doz. in box Doz. **45c**
1F3096—Same part curly with ...son bow. 6¾x5 1 in box, ½ doz. in pkg. D ... **$3.90**

...ssalue "Kestner" ... bisque, closed with new process combination set in...ted wash-able enamel, will not crack or chip, ...wearing paints and ...olorfast coloring, bust ...

...eyebrows, lashes and ...Doz. **85c**

**Kestner's Extra** ...in Bisque, moving eyes —Sewed curly wigs, with ...

...1 in box ½ doz in pkg. Doz. **$9.40**

...Doz. **$12.00**
1F3900—As 1F3940, 7½x5¾. 1 in box. Doz. **15.00**
1F3952—21x2¾, real eyelashes, curly wig, stitched side part, ½ doz in box. Doz. **$2.25**
1F3958—9¾x6¾, as 1F3954. 1 in box. Doz. **$8.25**

## "KIDLYNE" BODY DOLLS.

...ends and hands, ...ow, lies flat, of genuine ...are serviceable, and in ...real article if ...

1F4454 11½ in. ...ulders ...

...$ 45

1F4458—12½ h ...

...joints, real shoes, attached ...$1 98

...pink and blue open work stock... ...ings with shoes to match. 1 doz. in box. ...Doz. **$2 25**

**1F4468**—As 1F4402, 15½ in. side curls. ½ doz in ... Doz. **$3.25**

## CHINA LIMB DOLLS.

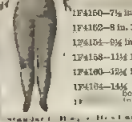
Not necessarily the biggest doll on paper but always the biggest seller in fact. Bodies ...

goods and prices.

**"Regulation" China** ...th Polka-dot dark ... ...lighting such box.

All have painted eyes, fea...

1F4150—7½ in. 1 doz. in box Doz. **27c**
1F4152—8 in. 1 doz. in box Doz. **32c**
1F4154—9½ in. 1 doz. in box Doz. **41c**
1F4158—11½ 1 doz. in box Doz. **72c**
1F4160—12½ in. 1 doz. in box Doz. **78c**
1F4164—14½ in., as 1F4162 box Doz. **$1.40**
1F ... in. 1 doz. in box ... $ 90



Standard Body, Head and Limbs

Our Pet Name Head Doll Body Fitted ... Dolls—The original and only genu...

...ing to the children. Plump, well ...

...ed shells. 1 doz. in box, assd ...

...and names of pictures 1 ½". In ... of a lock and word lock. Fine ... and name pictures, assorted colors. Assd. color bulbs and names in each box. 1F4200—7 ... $0 50

1F4210—12 " " ...
1F4232—18 " " ... 1 95

"Pe... ...Head China Doll... ...

colors, painted sour... ...gown features, sewed bodies. 1F4182—7½ in., assd. 1 doz. in box. Doz. **40c**
1F4196—14 " " ... **87c**

## POPULAR DRESSED JOINTED BISQUE DOLLS

1F4200 1F4202 1F4204

**1F4200**—6½ in., 5 styles, colored cambric ...ink, blue or red with lace trimmed ...fronts, kimono sleeves, bow trimmings, white ...tated caps. ½ doz. in box, assd. Doz. **43c**

...ed Scotch trimmings and ...ed Scotch trimmings and ...ch dresses lace aprons ...trimmed tam ...

**1F4702**—7¼ in., Scotch Highlander costumes, boy and girls assd., girls with plaid dresses and sashes, blue jackets, boys with blue ...suit, cord edged white ...

## "BILLY POSSUM"

Watch for Our Three New 10 Cent Games
"FLUFFY RUFFLES"
"LITTLE NEMO" and
"BILLY POSSUM"

Next month we show them for the first time. They will make a big hit. Controlled absolutely by Butler Brothers

## PATENT RIVET HIP JOINTED KID BODY DOLLS.

Good, lasting heads and hands, ... hair, painted eyebrows and lashes, mouth showing teeth ...

And patent riveted hip joints so dolls can be placed in any position, assd. black, pink and blue open work stockings with shoes to match

**1F4491**—12 in., flowing hair. 1 doz. in box.....Doz. **$2 25**
**1F4493**—16½ in., curly hair ... doz. in box.....Doz. **$4.25**
**1F4495**—19½ in., as 1F4493. 1 in ... **$4 75**

## NOVELTY "TEDDY BEAR" DOLL.

**1F4871**—8½ in., well modeled, soft stuffed body and jointed limbs covered with "Teddy Bear" mohair plush, turning head with hood, celluloid face with well painted features and hair, well shaped hands and feet covered with felt, ...ting up, surprise of mil... ...$2 25

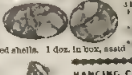
## SHELLS AND SHELL NOVELTIES

...ed Cush...n Asst ... styles, about 3 in., fancy ... scallop and cres... shells, natural col... or floral & hand ...

...stuffed cushions 1 ... Doz. **45c**

1F2... ...Paper Weights ...

...$2 25



## HANGING CONCH THERMOMETER

**80c**

...painted floral and gold decorated, some wi...

...Doz. **75c**

...Doz. **87c**

...small fancy ... and green ... molded showers and ...cold shower ...sions

...with thimble and loofer, well stuffed pin cushions, average height 6 in. Doz. **84c**

...box, assd. ...

...Doz. **96c**

...Doz. **$2 25**

...various floral assd. shells, ... shell ...

...painted floral decorations some with gilt ... ...ock

...Doz. **89c**

**3F709, Fancy Shell** Asst—5 styles, assd. colors, 6½ in. octagon scallop, conch and coal top tinted shells ...

...and ... decora...

...mals, match, jewel or pin holders, silk cord and tassel. 1 doz. in box, assd. ...Doz. **85c**

# MASKS & MASK SPECIALTIES

**All the new things as well as the old staples in paper mache, gauze and wire masks. Put up in assrtd. styles to package, giving the widest possible variety for small investment.**

### TRANSPARENT SLATES.

2F5[illegible] ... inches, each in glass, ck outlined pictures, ... Doz. 37c

2F5[illegible]—As 2F5[illegible] 7½ inches, ½ doz. in pkg. 79c

### MOIST COLOR PAINT BOXES.

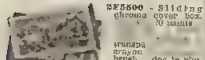
In hinged japanned metal cases, white ... lined

... doz. in pk ... Doz. 78c

2F5[illegible] 6 spaces in cover, ring holder, 16 thick cakes, ... 85c

### IMPORTED TOY PAINT BOXES

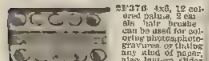
2F5500 — Sliding chromo cover box, 10 cakes ... 80c



... sponge, 3 camel hair brush ... doz. in pkg. Doz. 42c

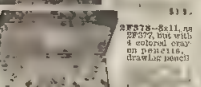
2F5502—Partitioned wood tray, sixteen 1½ ...

### ARTISTS WATER COLOR BOXES.

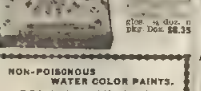


2F376 4x8, 12 colored pans, 2 camel hair brushes, can be used for coloring photographs, gravures or tinting any kind of paper, also lantern slides and pyrography. Doz. $2.10

... 7½—6x8 in. ...



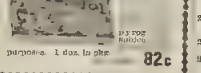
6 crayons and three pans in ebonite rubbers, 1 camels hair brush. Complete in box with palette and directions for use. ... $1.9...



2F378—8x11, as 2F377, but with 6 colored crayon pencils, drawing pencil ... size ... doz. in pkg. Doz. $6.35

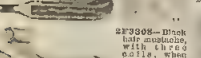
### NON-POISONOUS WATER COLOR PAINTS.

*Brilliant colors and also harmless.*

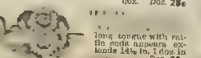


... paper ... purposes. 1 doz. in pkg. **82c**

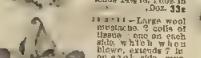
### BLOW EXTENSION TOYS



2F3605—Black tube mustache, with three coils, when blown each ... piece. 1 doz. in box. Doz. 28c



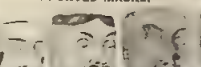
... long tongue with ruffle ends appears extends 14½ in. 1 doz. in ... Doz. 32c



2F3611—Large wool mustache, 2 coils of tissue ... end on each side, which when blower, extends 7 in. on each side, ... tache. 1 doz. in box. Doz. 36c

## MASKS & MASK SPECIALTIES

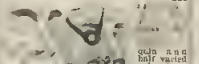
### IMPORTED MASKS.



2F3330—With wool ... in pkg ... 52c

2F3332—Assrtd. Brownie masks with mustaches, children's sizes. 2 doz. in pkg ... Do ...

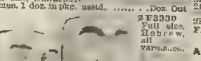
2F3327—Full size, assrtd. comical negro and negress faces. 1 doz. in pkg. assrtd. Doz. 32c



Full size, character ... women. 1 doz. in pkg. assrtd. ... Doz. Out

2F3335

2F3338—... girls and half veiled ... flown faces. 1 doz. in ... Doz. 32c



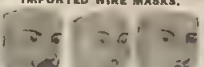
2F3335

2F3330—Full size, Hebrew, all ... varnished ... Doz. 36c

2F3334—Half face with metal ... patent beard on elastic so that wearer can drink or smoke without discomfort. ... 42c

... assrtd. Highland character ... in ...

### IMPORTED WIRE MASKS.

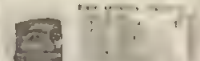


... 85c

... 85c

... $1.35

### CURTAIN MASKS.



... (Above in grs. lots, $2.50) ... Extra Quality Cambric eyelets. 1 doz. in pkg ...

2F796 ...

2F797 White ... 85c

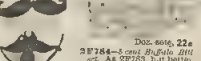
2F799—Red ... 85c

Fine Quality Satin. 1 doz. in pkg ... 2F800—Assrtd. colors, eyelets ... 1 in ...

### AMERICAN REAL HAIR MUSTACHES, ETC.

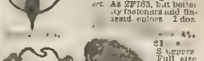
2F781—Fancy mustache; about 6 in., wire fastener, assrtd. colors. 1 grs. box. Grs. 80c

2F782—*Assrtd. mustache.* Similar to 2F781, finer quality and better made, assrtd. colors. 1 doz. in pkg. ...



... Doz. sets, 22c

2F784—*Assrtd. Buffalo Bill* ... As 2F783, but better fastened and ... assrtd. colors. 1 doz. ... 45c



2F785 ... 21 ... 8 sprays. Full size, sewed on ... mbric ...

2F786 ... 85c

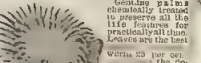
2F786—Negro wig. Full size, well sewed black cambric. ¼ doz. in pkg. ... Doz. $2.15

### EVERLASTING PALMS.

**Notice the Prices—**

**You Compare Quality!**

Leading palmists chemically treated to preserve all the life fineness for practically all time. Leaves are the best ... Worth 25 per cent. ... the coming ... received ... an occasional ... sending and washing off with tepid water. All securely potted, circular clay flower pots with moss fit... breaking. When ... handsome ... tightly, and ... will have ... natural drooping appearance ... in crates ... charge for crate.



... 70c

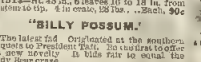
... 85c

... $1.00

4F1215—Nt. 45 in., 8 leaves 10 to 18 in. from stem to tip. 4 in circle, 18 Pcs. ... Each. 90c

### "SILLY POSSUM."

The latest fad. Originated at the southern banquets to President Taft. No cuisine to offer this new novelty in bills fair to equal the Teddy Bear craze.



2F5810—Hi...

plush body ... sitting pose ...

$4.25 ... 5 8 0—Hi. 12 in ... similar to above, better ... plush glass ... es. in box. Doz. $9.00

### AMERICAN MAKE GAUZE MASKS.

2F806—Children's sizes, tinted and ... assrtd. colors, large variety of ... styles. 16 box. ... Doz. 83c

2F80 ... Children, et... ... assrtd. elegant ... doz. in box ... Doz. 23c

2F805, Note—With spectacles and mustache. 1 doz. in pkg. ... Doz. 33c

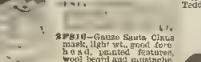
2F809—Painted in colors, a... ladies, assrtd. 1 doz. in box. ... Doz. 33c

2F810—Full size, ... painted natural ...

2F811—Full size, assrtd. negroes, clowns, Chinamen and Indians. 1 doz. box Dz. 33c

2F812—Full size, assrtd. Yankee, Irishman, Hebrew and Dutchman. 1 doz. in box. ... Dz. 33c

2F813 Fine grade, full features, natural effect, ... ladies and gentlemen. 1 doz. in box. Doz. 67c



2F810—Gauze Santa Claus mask, light wt., good face, head, painted features, wool beard and mustache ...

### DOMINO MASK.

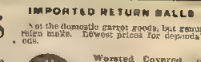
2F804. The regular satin "Domino," no curtains, assrtd. colors. 1 doz. in pkg. ... Doz. 75c

### MASK FASTENER.

2F805—Patent elastic fasteners. 100 in box Per 100. 60c

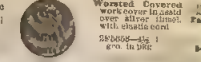
### IMPORTED RETURN BALLS

Not the domestic carrot goods, but genuine ... make. Lowest prices for dependable ... each.



Worsted Covered ... work cover in assrtd. ... over silver tinsel. Fa... with elastic cord ...

2F5658—4½ ... gro. in pkg ... 84c



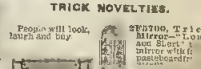
2F5691—Girl's 8½ in. ... doz. in box ... Doz. 27c

... about Effective ... assrtd. combination color, knitted waist of covering over silvered tinsel, yellow ball with ... rattle, elastic wrist cord. Doz. 40c

### TRICK NOVELTIES.

People will look, laugh and buy ... 27c

2F5700, Trick Mirror—"Long and Short" ... mirror with ... pasteboard ... 27c

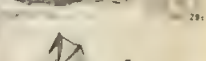


2F5705, "Funny Folks" Comic Cabinet. ... Doz. ... well made ... 3½ in. 1 doz in box Doz. 96c

### IMPORTED FRICTION TOYS.

Each has friction wheel and when turned sets toy in motion. 1 doz. in box, unless stated.

... 6 styles, including locomotive, boat, trolley and ... 29c



2F5236, Sloop—8½ in. litho metal sides, adjustable cardboard sails, attached to screw head driving wheel, rocking motion when in action ... Doz. 77c

2F5241, Express Wagon—Man with moving feet walks in shafts. Decorated tin, ... box ... Doz. 89c

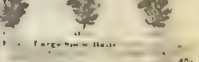
### READY MADE PAPER FLOWERS.

... Carna... ... 35c

... 35c

... 2 doz. in box ... 3...

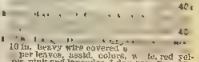
4F783, Large Rose-... red stem with 2 wax paper rose leaves and colors, pink, red, white and yellow. 2 doz. in box ... Doz. 35c



... Large ... Rose ... 40c

... 40c

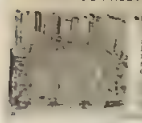
10 in. heavy wire covered ... per leaves, assrtd. colors, ... ted, yellow, pink and lavender. 1 doz. per ... Doz. 42c



... 87c

... 87c

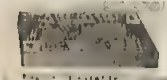
## PEN HOLDER ASSTS Contd.

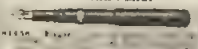


## THE "SUBWAY" PEN HOLDER ASST.

$1.20

## FOUNTAIN PENS.





8201—Large hand, rubber barrel chased in silver, gold plated pen, gilded filler. 1 doz. in box

$1.45

## SLING SHOT RUBBERS.

## RUBBER BANDS.

Red rock pitch. Pure gum. Full measure

### Narrow Rubber Bands

1 gro. in box.

| | | | | |
|---|---|---|---|---|
| 838—1/16 in. | .40 | 838½—5/32 in. | .60 | Box |
| 839—1/8 in. | .50 | 839½—3/16 in. | .90 | .80 |

### Heavy Rubber Bands.

| | | | |
|---|---|---|---|
| 833, 000¼—Size No. 6 | | | 40c |
| 870—Width ¼ to ⅜ in. | | | 60c |
| 871—Width ½ to ¾ in. | | | 90c |
| 872—Width ¾ to 1 in. | | | $1.25 |

## EXTRA HEAVY RUBBER BANDS

6? cross, $2.00

894, 00000¼—2½x½ in. 12 gro. in

$2.20

## VISITING CARDS.

Eaton Hurlburt's high class 2 ply white card. 25 cards in pkg., neatly bundled, 12 pkgs. in box, (Made in Berkshire.)

8644—1¼x3½ in. Per 100 .35

Card

## HURLBUT'S ASSORTMENT.

*You'll want assorted sizes. Try this*

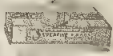
cards in pack, 20 packs in display box in gift box.

Per box. **72c**

8654 Asst.—100 each of 5 sizes in shaped box. Just every size and

**75c**

## ENVELOPES FOR VISITING CARDS.



Fine smooth finish white gloss good weight pointed flap.

# PLAYING CARDS

Made by the United States Playing Card Co.

**A revised line, far superior to the old.** These well known brands require no introduction to your trade. Each name and style [illegible] find at their respective prices. A trial order would convince you of their superiority.

## PLAYING CARDS.

## BICYCLE PLAYING CARD

$1.87

## PINOCHLE PLAYING CARDS.

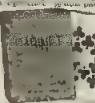
$1.87

## WHIST PLAYING CARDS

888, Bridge—

pack in gold stamped leatherette tele- $3.10

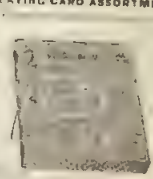
870, Cabinet



Each pack in [illegible] $3.7

½ doz. packs in [illegible]

## PLAYING CARD ASSORTMENT



from 10 to 25c each. Packed in leatherette covered dainty box with easel b

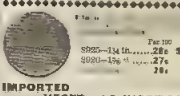
$1.75

## COMPOSITION POKER CHIPS.

### BEST QUALITY ENGRAVED CHIPS.

*Will make your line attractive and profitable*

| | | |
|---|---|---|
| Engraved | | |
| 8021 — 1¼ in. | | |
| Oxford | 40c | $4.50 |
| 8022 — 1½ in. " Rough | | |
| Rider | 40 | $4.50 |
| Crescent | 40c | $4.50 |



| | Per 100 | Per M |
|---|---|---|
| 8027—1¼ in. | 28c | $2.50 |
| 8028—1⅝ " | 47c | 2.60 |
| | 70c | 2 70 |

## THE "PICKET" SUPER ENAMELED PLAYING CARD.

*The best 15 cent card made.*

8812, "Picket"—Hard pressed finish, five color faces, super enameled, perfect slip, red and blue backs. Assd. in doz.

**$1.05**

## FORTUNE TELLING CARDS.

Cards, gold edges, 11c a stock highly finished in many Some of hand faces with meanings included—easy to use. Complete for playing all card games. ½ doz. packs in carton

Doz. $3.50

## TALLY CARDS.

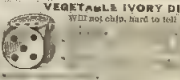
New designs all bright and attractive, the kind that sell. Demand increasing every day. Each with cord and silk tassel. 100 in box.

8810—Assd. designs, printed wood stock, 2¼x4¼.

8811 Lucky clowns and mice tions in black and red very

## IMPORTED VEGETABLE IVORY DICE.

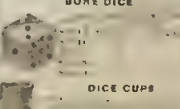
Will not chip, hard to tell from



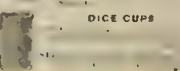
## 11 AND 12 SPOT CARDS.

8500, Five Hundred—Pack contains

## BONE DICE



## DICE CUPS

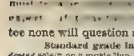


# MUSICAL INSTRUMENTS and SUNDRIES.

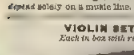
Every regular music dealer [illegible] tee none will question and on *exactly similar* goods name prices which are one good profit lower than the exclusive dealer asks.

**Standard grade instruments** are the only kind you can afford to handle. You cannot however, afford to pay 50 per cent more merely for [illegible] name or because the exclusive dealer must *depend* solely on a music line, two-thirds of which are slow [illegible] for samples for actual test in your own store.

### VIOLIN SETS.
*Each in box with rosin.*

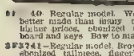


9F 40 Regular model. Well finished and better made than many offered at much higher prices, ebonized fingerboard and tail-piece, ebonized bridge, fancy board and sides. How to name. Each $1.25



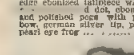
3F3741—Regular model Brown shaded finish ebonized tailpiece, fingerboard and pegs. Good bow, tone tip and screw, ebonized fine pearl eye and bone inlaid, German silver cap, silver thread wound..... Each, $1 60

3F3742 "Kopf" model. 7 piece back, full finish shaded brown with yellow beveled ribs ebonized tailpiece with 3 piece pearl d dot, ebonized fingerboard and pegs, pearl dot and circle inlaid, good bow, German silver tip, pearl inlaid and pearl eye frog ..... Each $2.00



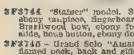
3F3744 "Stainer" model. Shaded field red ebony tailpiece, fingerboard and key, rib. Brazilwood bow, ebony frog, pearl dot and sides, bone button, ebony dot..... Each $3.25

3F3745 – Grand Solo "Amati" model. Fine flamed back, back and sides, ebony fingerboard, tailpiece and pegs, shaded light brown and yellow polished, purfling around [illegible] rosewood bow, german silver tip, ebony frog, pearl dot and slide, [illegible] Each ..$3.75

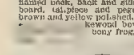


3F3746—"Stradivarius" model. Ebony fingerboard, tailpiece and pegs, highly polished dark brown finish, [illegible] beveled edge and finely finished head. Brazilwood bow, leather wound, grip, ebony frog, pearl dot and slide, german silver lined [illegible] $4.00

3F3747 "Maggini" model. Reddish brown double purfling, ebony fingerboard, tailpiece, pegs, snakewood bow, solid ebony slide, silver button, bone tip [illegible] and slide and ebony, german silver cap and [illegible] Each, $4.50

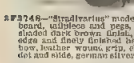


3F3748—"Amati" model. Shaded reddish brown finish, flamed maple back pearl inlaid, flamed neck and sides, inlaid white and black front edge, 5 piece pearl flower inlaid ebonized fingerboard, plated tailpiece, 4 piece inlaid pearl flower and pearl bound [illegible] Brazilwood bow, inlaid snakewood ebony frog, 3 pc. pearl flower inlaid screws silver cap and lining, german silver and ebony button, leather wound. Each, $5.25

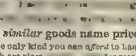


3F3749—Conservatory violin "Jacobus Stainer" model, shaded old brown, full ebonized trimmings octagon Brazilwood bow, ebony frog, pearl inlaid and figured silver lined, button and pearl dot..... Each $6 00

3F3750—Strad. variety model. Fine [illegible] red, ebony trimmings finely finished with a stamped "Conservatory Grand" [illegible] d edge. Each, snakewood. [illegible] Inlaid..... Each $6.75



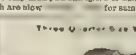
3F3752 — *A professional outfit.* "Stradivarius" model. Red brown shaded, full ebony [illegible] finished neck made of selected stock. 20 in. Pernambuco octagon bow, ivory tip, pearl slide and eye, ebony frog, full german silver lined, all [illegible] ..... $10.00



3F3781 – "Stradivarius" model. Ebonized fingerboard, tailpiece and pegs, all shaded light red, purfling around edge. Inlaid, Brazilwood bow, full german silver mounted, ebony frog with pearl dot and slide. Complete in box with rosin ..... Each, $2.75

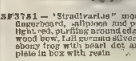
### "STAR" BRAND GUITARS.

Every instrument guaranteed every month. All only one inspection before leaving factory. Each inlaid with high mahogany neck, ebonized oval fingerboards, in all with 3 pearl position dots unless otherwise noted. All except 3730 have pearl

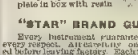


of strings. For quality workmanship, finish, [illegible] prices here named.

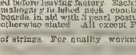
3F730—Light mahogany finish, spruce front with fillet variegated color inlaying around sound hole, ebonized bone pin bridge. Each, $1.50



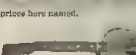
3F742—Rich rosewood finish, spruce front with variegated color inlaid lines around sound hole, marquetry inlaid strip down back, ne. tailpiece..... Each, $1.85



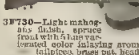
3F732—Concert size, as 3F731.... " 2.00



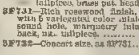
3F733 Rich antique oak finish, [illegible] Spruce, spruce front with 3 and 5 ring variegated color inlaying around sound hole, [illegible] old bound and inlaid front edge, [illegible] inlaid strip down back, ne. tailpiece..... Each $2.25



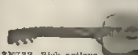
3F735—Genuine quartered oak natural finish, hand rubbed piano polish eastern white spruce front, variegated lines and colored inlaying around sound hole, variegated color inlaid strip down center of [illegible] bound back, ebony fingerboard bands and tailpiece..... $1.75



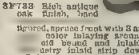
3F736—Concert size, as 3F7 $1.75




3F784—Rich mahogany finish, eastern white spruce front with 3 and 5 line variegated color inlaying around sound hole, bound front, mahogany inlaid [illegible] pated color inlaid bound front, ma. [illegible] nkl. t [illegible] eb $2.75

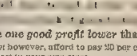


3F737—Handsome rosewood finish, hand rubbed and polished throughout, eastern white spruce front, variegated color line inlaying around celluloid bound sound hole, wide variegated colored line inlaying around celluloid bound front and back edges, variegated color inlaid strip down back, genuine ebony fingerboard, nkl. tailpiece and pat. [illegible] ..... Each, $3.75

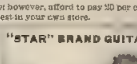


3F739 Genuine mahogany piano polished throughout, eastern white spruce front with variegated color inlaying around celluloid bound front edge, variegated lines and colored inlaying around celluloid bound sound hole, celluloid bound back edge, variegated colored inlaid strip down center and around edge, genuine mahogany neck with rosewood veneered head, nkl plated pat. heads, genuine ebony fingerboard and tailpiece and pat. [illegible] Each, $4.50

### "STAR" BRAND GUITARS—Contd.



[illegible] and [illegible] finish, piano polished eastern white spruce front, 3 variegated color inlaid rings around sound hole, rosewood bound back, wide variegated color inlaying around celluloid bound front and back edges, variegated color inlaid strip down back, genuine mahogany neck, rosewood veneered head, nkl. plated pat. heads. Each, $4.75

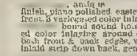


3F745 Genuine quarter sawed [illegible] and rubbed [illegible] mahogany finish, white spruce front 5 wide variegated color inlaid ring around sound hole beautifully variegated color inlaying around both celluloid bound front and back edges, variegated inlaid [illegible] back, mahogany neck with rosewood veneered head, nkl. plated pat. heads, solid [illegible] bound back, celluloid bound genuine ebony fingerboard with 4 inlaid pearl positions, nkl plated pat heads with [illegible] bone nut, wedge and end piece, genuine ebony tailpiece with pearl inlaid bridge pins. Each $7.00

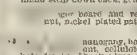
[illegible] mahogany back, and neck, showing the natural grain in [illegible] of open pearing white spruce [illegible] rubber plane polished throughout, variegated color inlaid rings around celluloid bound sound hole, beautiful and wide variegated inlaying around bolt on bound front and back edges, variegated color inlaid strip down back, celluloid bound genuine ebony fingerboard with beautiful pearl inlaying of pearl, rosewood veneered celluloid bound heads, genuine ebony tailpiece white bone end piece, bridge pins bridge and nut, nkl. plated pat. heads with white bone keys. For quality tone, etc., this instrument is the best to be had at any price. Ea. $8.25

### "STAR" BRAND MANDOLINS.

ve mahogany extension necks and per lined patent heads, composition buttons, nickel trimmings. Ebonized 3F800 have inlaid star in head. Each in cardboard box.

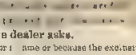


3F800—8 ribs, maple & walnut, inlaid color- [illegible] ed body, [illegible] white spruce front, inlaid sound hole, bolt, tortoise guard plate, finish, unpurfled, 3 pearl position dots, mahogany finish neck and head, nickel, patent [illegible] ing between ribs, [illegible] tortoise [illegible]



3F800—13 ribs, dark mahogany and oak, white [illegible]

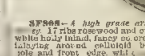
### "STAR" BRAND MANDOLINS—Contd.



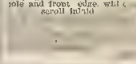
3F805—*A high grade article for the money.* 17 ribs rosewood and ornamental maple, white holly inlaid binding, fancy marquetry inlaying around celluloid bound sound hole and front, [illegible] with [illegible] scroll inlaid [illegible] pole and [illegible] $3 50

[illegible] ribs, genuine rosewood, white holly inlaid neat marquetry inlaying around celluloid bound sound hole and edge, white spruce front, inlaid, black guard plate, 4 pearl position dots on genuine ebony fingerboard, white bone nut rosewood veneered head, genuine [illegible] polished nickel plated pat tension tailpiece $4 00

3F813—A money maker. 21 rib genuine rosewood and silver maple, pearl and Black inlay, ornamental celluloid bound sound hole, fancy marquetry inlaying around celluloid bound edge, silver engraved tailpiece, fancy white scroll inlaid [illegible] guard plate, 4 pearl position dots on ebony fingerboard, white bone nut, rosewood veneered head, genuine mahogany neck, nickel plated patent heads ..... $5.75



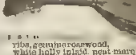
3F814—21 rib fancy rosewood rim white holly inlaid, [illegible] ed borders around celluloid bound sound hole and front edge, fancy white scroll inlaid [illegible] tortoise guard plate, bone saddle, genuine pearl fingerboard, 4 fancy pearl position dots, ebony veneered head on genuine mahogany neck, white bone head nut, engraved nickel plated covered tailpiece $6.75



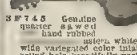
3F816—21 rib fine rosewood, white holly inlaid, neat fancy inlaying around celluloid [illegible] sound hole, white scroll inlaid, tortoise guard plate, ebony [illegible] white bone saddle, inlaid [illegible] neered ebony [illegible] and finger board, white bone head [illegible] Ebony [illegible] tuning [illegible] nickel plated patent [illegible] [illegible] $8 50

[illegible] ribs genuine rosewood and silver birdseye maple, white holly inlaid binding, polished skirt and heel, extra fancy marquetry inlaying around celluloid bound front [illegible] bridge, bone saddle, fancy scroll inlaid [illegible] tortoise guard plate, celluloid bound genuine ebony fingerboard, fancy pearl scroll throughout, bone head nut, ebony veneered head with white mahogany neck, silver engraved [illegible] position dots, covered patent screws, white keys, patent covered tailpiece. Each, $7.50

### CANVAS INSTRUMENT CASES.



3F3765, Violin Size

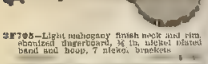


[illegible] $2.75

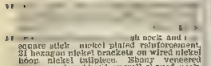
| | |
|---|---|
| [illegible] | [illegible] |
| [illegible] | [illegible] |
| 3F3766, Mandolin | 75c. |
| 3F3767, Guitar—As 3F3765 | 75c. |
| 3F3768, Banjo—As 3F3765 | 75c |
| 3F3769, Guitar Concert size, leather bound edges, otherwise as 3F3765 | Each 70c |

## "STAR" BANJOS.

Six have 11 in. best calfskin heads, each with 20 raised german silver dots, white, pearl tablet scar in head with exception of first 3 numbers which have german silver embossed star, fancy cut s. These instruments are made for us ex tively by one of the most reliable banjo manufacturers in the country. Each in cardboard



**3F705**—Light mahogany finish neck and rim, ebonized fingerboard, ¾ in. nickel plated band and hoop, 7 nickel brackets. Each



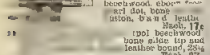
**3F710**—Light mahogany finish neck and r square stick nickel plated reinforcement, 24 hexagon nickel brackets on wired nickel hoop nickel tailpiece, ebony veneered ard and bead on well shaped neck. 6 pearl position dots. Each **$2.75**

**3F711**—Light natural mahogany finish neck, birdseye maple wood rim, 24 hexagon brackets pearl position dots, ebonized veneered fingerboard and head. Each **$3.50**

**3F713**—Natural finish light mahogany neck, 4 bars stick, birdseye maple rim, 30 hexagon nickel brackets, ebonized veneered head and fingerboard, 6 pearl position dots. Each **$4.00**

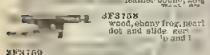
## VIOLIN BOWS.

The market s best values at lower prices than jobbers elsewhere



**3F3766**—Polished rod beech wood, ebon frog, pearl dot, bone button. Each **12c**

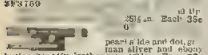
**3F3767**—Polished rod beechwood, bone slide tip and leather mount, 28½ in. Each **17c**



**3F3768**—wood, ebony frog, pearl dot and slide ger and i

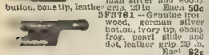
**3F3169**—d tip

**3F3**—n. Each **35c**

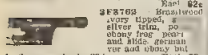


pearl s ids and dot, g man silver and ebony button, cone tip, leather grip, 29 in. Each **50c**

**3F3761**—Ebonized wood, german silver bands, ivory tip, ebony frog, pearl slide and dot, leather grip 29 in. Each **62c**

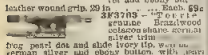


**3F3762**—Rosewood ivory tipped, 2 silver trim, p ebony frog pearl and slide, german silver and ebony but



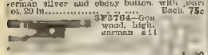
leather wound grip 29 in. Each **59c**

**3F3763**—Torpedo genuine Brazilwood octagon shape, german silver trim



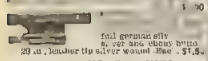
frog pearl dot and slide ivory tip, w german silver and ebony button, with grip 29 in. Each **75c**

**3F3764**—Gen wood, high german silv



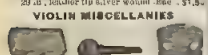
full german silv ng, ivory and ebony butto 29 in., leather tip silver wound. Each **$1.8**

## VIOLIN MISCELLANIES

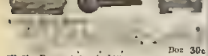


Doz **30c**

**Violin Pegs**—2 doz. in box. **3F706**—Maple ebonized, Doz. **10c**
**3F707**—Ebony t rosewo Each

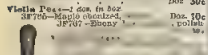


**Violin Tailpiece**—doz. in pkg **3F709**—Imit. ebon 8 color Boxw ard Do polishe 12 ea.

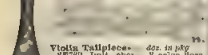


Tailpiece

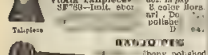
**BANJO PEG**

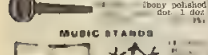


Ebony polished dot 1 doz.



**MUSIC STANDS**



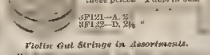


3F760 3F761

nickel plated folding compactly in 2 parts, no thumb screws, easily adjusted, strictly high

## GUT STRINGS.

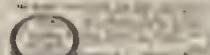
We do not sacrifice quality for price. First quality goods at the lowest possible price.

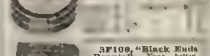


try Best in the market at these prices. 1 doz. in box.

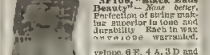
3F171—A, ½
3F172—D, 2½ "

*Violin Gut Strings in Assortments.*





**3F169, "Black Ends Beauty"**—Most perfect. Perfection of string making. Superior in tone and durability. Each in wax envelope, varnished,



in one size 6 F, 4 A, 3 D and 2 G. Per box of 15. **$1.25**

*Gut Strings in Sets. Each set in box.*

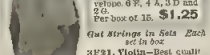
**3F321, Violin**—Best quality German strings, a specially long, 1 extra E string in each set. Doz. sets **$1.85**

**3F314, Banjo**—Extra quality, double length, 4 sh. gut and 1 silk wire wound in set, for professional use. Doz. sets **$2.50**

**3F320, Guitar**—Extra fine quality, 2¼ longths, 3 silk gut and 3 silk wire wound in set, for professional use. Doz. sets **$3.25**

## STEEL STRINGS.

*Banner Brand Steel Strings*

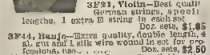


These are made exclusively for us and are of standard quality silvered steel wire. 1

and white

| | Gro. | Doz. |
|---|---|---|
| | | 3 |

**3F5**—G or fourth, spun
**3F6**—D or fourth, spun on gut.
**3F7**—G or fourth, spun on gut, silk ends.



Banjo.
**3F8**—First or fifth
**3F9**—Second,

*Steel Strings in Sets—Each set in box.*

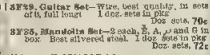
**3F30, Violin Set**—Complete set superior quality steel strings. 1 doz. sets in box. Doz. sets **36c**

**3F38, Guitar Set**—Wire, best quality, in sets of 6, full length 1 doz. sets in box. Doz. sets **76c**

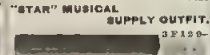
**3F35, Mandolin Set**—2 each, E, A, D and G in box. Best silvered steel. 1 doz. sets in box Doz. sets **72c**

## "STAR" MUSICAL SUPPLY OUTFIT.

**3 F 12 9—**



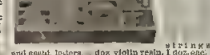
1 portfolio covered



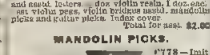
strings

and metal holders 1 doz. violin resin, 1 doz. assorted violin pegs, violin bridges metal, mandolin picks and guitar picks. 1 cloth cover. Total for asst. **$2.00**

## MANDOLIN PICKS.



**3F778**—Imit tortoise shell oval shape. 1 doz. in envelope. Doz. 6c

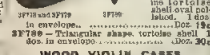


3F778 and 3F779 3F799

ine tortoise shell oval colluloid. 1 doz in envelope. Doz. **12c**

**3F780**—Triangular shape, tortoise shell 1 doz. in envelope. Doz. **30c**

## WOOD VIOLIN CASES.



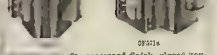
**3F747**—Regular size, wood ebony finish, half fel-lined, hooks and handle Each **34c**
**3F748** As above, lock and key wood ers with strong rs Each **$1.00**

## POPULAR PRICED ACCORDIONS.

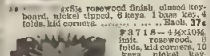
A splendid line, including everything of worth in popular priced accordions. Our prices should interest every buyer who purchases by value. Each

**3F3734** Italia model Verona

o pe panels, 10 leather ette bellows with ness protectors, nickel trim ishes and clasps 10 pearl button keys, 2 pearl but



me filled with h



**3F3718**—½x20¼ imit. rosewood, 6 folds, lid corners, 10 keys, nickel key board. Each **75c**

Ebony fin ish, 6x12, 2 stops 8 sets of reeds double row keys

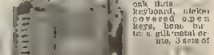
bl ad stop, 3 brass keys, nickel chain and corners, ch

rnings and clasp Each, **$3.25**

**3F3719**—84x48, 10 nickel keys, open key board, 4 bllnd stops, 6 folds ebony finish nickel corners and clasps. Each **87c**

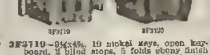
***3F733**—oak finis keyboard, nickel covered open keys, bone fi ts 4 guitar stops, 3 sets of

**3F3720**—12x18, rosewood and ebony finish, fancy molding open keyboard, 10 keys, blind stop, 6 bellows 6 folds. Each **$1 15**

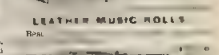


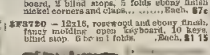
ebony finish heavy double 1 folds each with nickel

nickel covered open keys 4 sets stops, 1 blind, 2 sets reeds, nickel corners and clasps. Each **$1.45**



board, double lows, 8 folds nickel clasps and





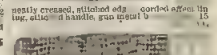
Ing 4 bellows 6

ment front flannel lined, leatherette straps Each **$1.80**

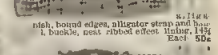
## LEATHER MUSIC ROLLS

Real

nestly creased, stitched edg cordel effect lin ing, silk cord handle, gun metal b



nish, bound edges, alligator strap with n i, buckle, seal ribbed effect lining, 14½ Each **$2.50**



creased handle and strap. 14½x16. Each **$2.00**

tan leather, sunded Mexican carved effect floral embossed ol handle & strap, brass buckle, 16x.5 Each **$3.75**

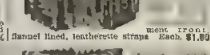
leather, nearly creased edges leather bound, creased black leather h and strap, leather covered buckle, black moire lined 18x5½ Each, **77c**

## LEATHER MUSIC SATCHELS AND HOLDERS.

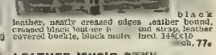
We have never before been able to offer values. Becoming more popular every Each in box.

g1 covered, open keyboard, 2 reeds, 2 stops (1 blind), double bel

**3F8133**—Sa ror leather finish bound

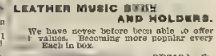


nickel banded bel



tuan bin Each **36c**

open work nickel ornaments, 12



**3F8727**—12x9, oak finish nickel co

gilt metal orn ment, sunk ke

rnal buttons 15 Each **60c**

2 wood

**3F6142** Real world grain leaf, neatly creased

nusic protectors and corners nickel el clasps, flannel

rage Each, **$2.15**

**3F3735**—12x6, rosewood, finish nickel covered

**3F6145** Rea

rnals, 2 stops (1 blind) 3 bellows, 6 folds, all with

grain finish, neatly stitch ed and creas

nickel clasp. 12

strap, gilt be music in place. 14½x15

# Magnifying Glasses

**Vulcanized Rubber Folding Case**
Two Lens

| No. | Size Inches | Per Doz. |
|---|---|---|
| 63 | 1¼ | $15.00 |
| 69 | 1½ | 21 00 |

**Nickel Plated Folding Case**
One Lens

| No. | Size Inches | Per Doz. |
|---|---|---|
| 15831 | 1⅛ | $12.00 |

**Nickel Plated Folding Case**
Two Lens

| No. | Size Inches | Per Doz. |
|---|---|---|
| 15832 | 1⅛ | $16.00 |

**Nickel Plated Folding Case**
Three Lens

| No. | Size | Per Doz. |
|---|---|---|
| 15833 | 1¼ | $24.00 |

# Surveyors' Compass

**No. 1787**

Brass Case with Folding Sights, Levels, Jacob Staff and Ball Socket, Silvered Raised Dial with Full Divisions. Jeweled Bar Needle with Stop

| Size M-M | Size Inches | Each |
|---|---|---|
| 90 | 3½ | $18.00 |

# Magnifying Glasses

Nickel Plated Folding

| No. | Per Doz. |
|---|---|
| 1590 | $ 4.00 |

Nickel Plated Folding

| No. | Size M-M | Size Inch | Per Doz |
|---|---|---|---|
| 1585 | 34 Lens | 1 1/16 Lens | $30.00 |

**"Coddington"**
Nickel Plated Folding Case

| No. | Size M-M | Size Inches | Per Doz. | No. | Size Inches | Per Doz |
|---|---|---|---|---|---|---|
| 1612 | 20 | ¾ | $18.00 | 62 | 1¼ | $ 9.00 |
| | 30 | 1⅝ | 33.00 | 68 | 1½ | 12 00 |

**Vulcanized Rubber Folding Case**
One Lens

# Water Motors

These Motors are suitable for any purpose requiring power within their capacity, and even where water must be paid for by meter they will be usually more economical than electricity, and with less first cost, and practically no danger of getting out of order. They are used for sharpening and polishing cutlery, washing bottles, running sewing machines, fans, jewelers and dental lathes, air compressors, washing machines, ice cream freezers, drills, coffee mills, meat choppers, etc

**All Motors are made of best quality iron castings, solid and substantial, but where first cost is no object, and to secure lightness, they will be made of fine cast aluminum, at a reasonable extra price.**

No 2, No. 3 and No 4 Motors are equipped with removable brass bearings, which may be replaced for a few cents, when worn. and have two sizes of nozzle to adapt them to any ordinary water pressure. They also have an oval shaped enlargement of the casing, as shown in the cut, this enlargement being opposite the point where the jet of water strikes the wheel and is so shaped that the water, in rebounding from the wheel is conducted downward, to the outlet without splashing back to the wheel, thereby seriously interfering with the power.

Motor is operated by a single jet, delivered through a perfectly shaped exchangeable nozzle, and we know that more power is derived thus than from two or more jets of smaller size covering the same amount of water.

Motors are equipped with standard hose connections and should fit any standard faucet, but special connections will be furnished for 50 cents each to fit any faucet threaded or smooth, if we are given data from which we can work.

**In every letter concerning Water Motors, always state water pressure.**

## POWER OF WATER MOTORS

| Size, Inches | Head in Feet | Pressure Pounds | Speed of Velocity, Feet per Minute | Revolutions per Minute | Horse Power | Size, Inches | Head in Feet | Pressure Pounds | Speed of Velocity, Feet per Minute | Revolutions per Minute | Horse Power |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 20 | 8 66 | 2151 97 | 684 | .05 | 6 | 100 | 43 30 | 4812. | 1530 | .60 |
| 6 | 30 | 12 70 | 2635 62 | 837 | .10 | 6 | 120 | 51 96 | 5271.30 | 1677 | .79 |
| 6 | 40 | 17 32 | 3043 39 | 969 | .15 | 6 | 140 | 60 62 | 5693.65 | 1812 | .99 |
| 6 | 50 | 21 65 | 3402 61 | 1082 | .21 | 6 | 180 | 77 94 | 6455 97 | 2049 | 1 45 |
| 6 | 60 | 25 98 | 3727 37 | 1185 | .28 | 12 | 80 | 34 64 | 4303 99 | 684 | 1 00 |
| 6 | 70 | 30 31 | 4026 | 1281 | .35 | 12 | 140 | 60.62 | 5693.65 | 906 | 2.33 |
| 6 | 80 | 34 64 | 4303 99 | 1368 | .43 | 12 | 180 | 77.94 | 6455.67 | 1024 | 3 39 |
| 6 | 90 | 38 97 | 4565 04 | 1452 | .51 | | | | | | |

To get the power it is only necessary to increase the size of jet, thereby delivering more water to the motor just as it is necessary with a steam engine to give more steam to get more power. The smallest jet necessary to give the required power should be used.

## MOTORS

| No. | | Each | No. | | Each |
|---|---|---|---|---|---|
| 1 | —5-inch Diam. of Casing. | $4 00 | 3 | 8-inch Diam. of Casing. | $16 00 |
| 2 | 6-inch Diam. of Casing... | 6 65 | 4 | 12-inch Diam. of Casing. | 40 00 |

These prices include a face emery wheel for cutlery grinding, cotton buff wheel, two sticks of polishing rouge, finest quality, extra nozzle (or jet) and small grooved pulley. All in neat box, excepting No. 4, which is equipped only with a wood pulley of any size up to 24 inches Diam.

## THREE SPEED COUNTERSHAFT

Suitable for attachment to either the No. 2 or No. 3 Motors..... Each $8 00

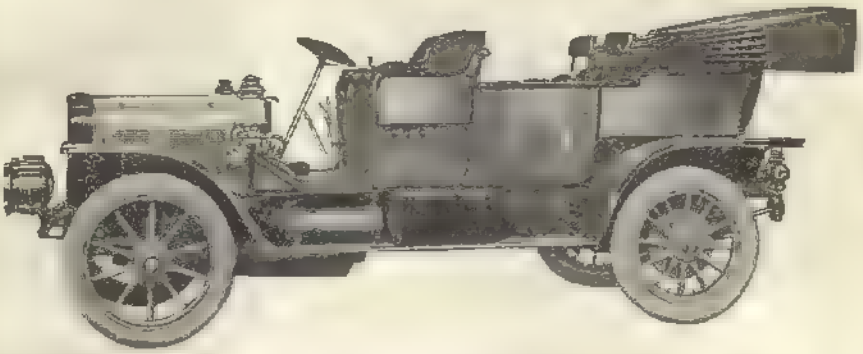
This counter shaft can be attached to the motors at the factory without extra charge for the work or may be attached by the user later, by drilling three small holes in the motor casing.

## EXTRA ATTACHMENTS FOR MOTORS

| | Each | | Each |
|---|---|---|---|
| Emery Wheels—Small. | $1 00 | Pulley for Round Belt... | $0 50 |
| Emery Wheels—Medium. | 1 50 | Pulley, Two Speed..... | 80 |
| Emery Wheels—Large.. | 2 00 | | |

# THE WHITE STEAMER

## Is the Most Desirable Car



The White Steamer has many desirable qualities not possessed by any other automobile. It is the only car which is noiseless, odorless, smokeless and free from vibration. It is the only car which can be driven at any speed without the shifting of gears. For these reasons the passengers in a White enjoy a degree of comfort not obtainable in any other type of car.

The superiority of the White in these respects was well summed up in the following official report by the Quartermaster-General of the United States Army:

> "The White is simple in operation. The means of propulsion being steam, it is better suited for the transportation of the sick and wounded than gasoline cars on account of its free and smooth running, freedom from violent vibration and ease of controlling the speed between maximum and minimum without jerks or jolts."

These considerations, which influenced the War Department (and later the Navy Department) to adopt the White exclusively for motor ambulance work, should incline the private purchaser, who values simplicity and comfort, toward the White.

The White has an unequaled record for supreme reliability and for low cost of up-keep, and anyone who purchases a car without at least investigating the White is acting with only a partial understanding of present-day attainments in the construction of automobiles.

We make two models—a 20 horse-power car at $2000 and a 40 horse-power car at $4000 (shown above).

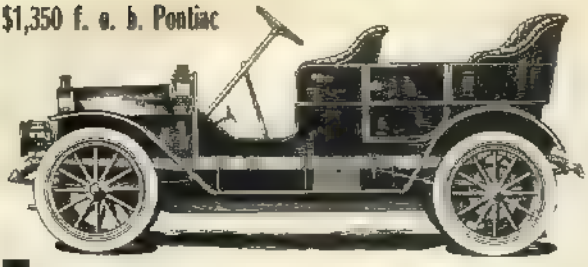
**WRITE FOR CATALOG**

# THE WHITE COMPANY

## CLEVELAND, OHIO

**New York City, Broadway at 62d St.**
**Boston, 320 Newbury St.**
**Philadelphia, 629-33 N. Broad St.**
**Pittsburg, 138-148 Beatty St.**
**Cleveland, 407 Rockwell Ave.**
**Chicago, 240 Michigan Ave.**
**San Francisco, Market St. at Van Ness Ave.**
**Atlanta, 120-122 Marietta St.**

$1,350 f. o. b. Pontiac



## Equipped with our Chain-in-Oil Drive

# Which is Guaranteed

## to wear the life of the car

No manufacturer of automobiles ever did such a thing before.

A drive has never been made which the builders were willing to stand back of until the car was worn out up to the time we put our 1909 models on the market.

On the Cartercar the chain runs in a bath of oil, encased in a dust and grit tight aluminum housing.

It is not a tin contraption nor is it made of burlap.

It is a substantial, durable, lasting invention which has never had an equal since the Friction Transmission was devised.

With our Friction Transmission and our Chain in Oil drive, the Cartercar is as noiseless as an electric.

Some call it the "No car."

This is because it has no clutch to slip no gears to strip—no water pump to clog—no fan to break no universal joints—no shaft drive—no grease packings to renew—no bevel gears—no noise—and only one control lever.

The Cartercar will travel any speed from zero up. It will climb a 50 per cent. grade which is greater than any other can climb with a load.

We do not need to tell you about the materials and workmanship which go into the Cartercar.

The fact that we guarantee the complete car against defective parts for ninety days, and the drive for the life of the car, speaks for itself

We also build a four cylinder 20 H. P. Gentlemen's Runabout at $1,000.

Write about our Touring Cars, Runabouts, Coupes, Taxicabs, Landaulets and Delivery Vehicles.

# Cartercar Company

**Pontiac - - Mich.**

Member A. M. C. M. A.

**Use This Coupon**

CARTERCAR CO.
Pontiac Mich
Gentlemen:—Please send me further matter regarding your Friction Transmission, Chain-in-Oil driven cars.

Name . . . . . .

Address . . . . . .

. . . . . .

TRADE JOURNAL

# Ship Carpenters Tools

WHITES

**No. 50—Socket Ship Chisels**

Hickory Handles, with Iron Rings. 5½ inch Blades

| Size, inches | ¼ | ½ | ¾ | 1 | 1¼ | 1½ | 1¾ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| Per doz | $10.00 | $10.50 | $11.00 | $12.00 | $13.50 | $15.50 | $16.50 | 19.00 | $22.00 | |

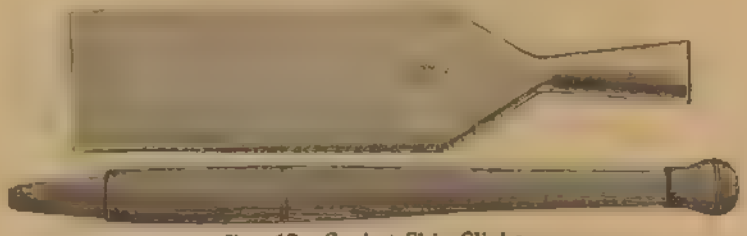
**No. 51—Socket Ship Gouges**

Hickory Handles, with Iron Rings. 6½ inch Blades

| Size, inches | ½ | ¾ | 1 | 1¼ | 1½ | 1¾ | 2 | 2½ | 3 |
|---|---|---|---|---|---|---|---|---|---|
| Per doz | $12.00 | $12.50 | $13.00 | $14.50 | $16.00 | $18.50 | $19.50 | $22.00 | $25.00 |

**No. 144—Ship Chisel Handles**

Hickory, with Iron Rings, assorted ..... Per $1.50



**No. 12—Socket Ship Slicks**

Oval Back 9 in. Blades. Steel Laid. Applewood Handles.

| Size, inches | 2½ | 3 | 3½ | 4 |
|---|---|---|---|---|
| Per doz | $22.00 | 25.00 | 30.00 | 35.00 |

**No. 44—Plain Ship Adzes**

| Cut | Per Doz. |
|---|---|
| 4 in. | $30.00 |
| 4¼ in. | 30.00 |
| 4½ in. | 33.00 |
| 4¾ in. | 33.00 |
| 5 in. | 33.00 |

**No. 45—Lipped Ship Adzes**

| Cut | Per Doz. |
|---|---|
| 4½ in. | $36.00 |
| 4¾ in. | 36.00 |
| 5 in. | 36.00 |
| 5½ in. | 59.00 |
| 6 in. | 42.00 |

**No. 47—Ship Mauls**

| Weight | Per Doz. |
|---|---|
| 4½ lbs. | $17.00 |
| 5 lbs. | 20.00 |
| 5½ lbs. | 23.00 |
| 6 lbs. | 23.00 |
| 6½ lbs. | 23.00 |

# Ship Axes

WHITES

No. 46

| Cut | Weight | Per Doz. |
|---|---|---|
| 6½ in. | 5 lbs | $36.00 |

# Broad Axes

WHITES

No. 25—Canada Pattern

| Cut | Weight | Per Doz. |
|---|---|---|
| 10 in. | 6 lbs. | $45 00 |
| 10½ in. | 6½ lbs. | 45 00 |
| 11 in. | 7 lbs. | 45 00 |
| 11½ in. | 7½ lbs. | 45 00 |
| 12 in. | 8 lbs. | $45 00 |
| 12 in. | 8½ lbs. | 45 00 |
| 12½ in. | 9 lbs. | 45 00 |
| 13 in. | 9½ lbs. | 45 00 |

# Whitley Exercisers

| No. | | Each |
|---|---|---|
| 0–Vim, | Three Pulleys with Long Cord. Choice of Light, Medium or Heavy Cord | 2 00 |
| 1–Standard, | Three Fine Steel Pulleys, Anderson's Physical Education with each Exerciser. Choice of Light, Medium or Heavy Cord | 3 00 |
| 2A Athlete, | Three Corrugated Wheels and Cork Grips, Anderson's Physical Education with each set, Choice of Light, Medium or Heavy Cord. | 4 00 |
| 3–Special, | Nickeled Parts and Cork Grip, Silk Covered Cable, Anderson's Physical Education with each Exerciser. Choice of Light, Medium or Heavy Cord. | 5.00 |

**Extra Cable for Whitley Exercisers**

| No | 00 | 0 | 1 | 2A | 3 |
|---|---|---|---|---|---|
| Each | $ 70 | 1 25 | 1 50 | 2 00 | 2 50 |

# Dumb Bells and Indian Clubs

Indian Clubs

Maple Dumb Bells

**MAPLE INDIAN CLUBS**

| Weight, Pounds | ½ | ¾ | 1 | 1½ | 2 | 2½ | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|---|
| Per Pair | $0.35 | .40 | .50 | .60 | .70 | .85 | 1.00 | 1.30 | 1.50 |

**MAPLE DUMB BELLS**

| Weight, Pounds | ½ | ¾ | 1 | 1½ | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| Per Pair | $0.35 | .40 | .50 | 60 | .70 | 1 00 | 1.30 | 1.50 |

**IRON DUMB BELLS**

| Weight | ½ | 1 | 1½ | 2 | 2½ | 3 | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Per Pound all Sizes | $0 10 | .10 | .10 | .10 | .10 | .10 | .10 | .10 | .10 | .10 | 10 |

# Chase
# Automobile Robes

## For All Seasons

¶ Fine Mohair Plush Robes in Plain Colors and Beautiful Fur Effects.

¶ Rubber Face and Rubber Interlined Robes for Fall and Winter Use. Cloth Robes of all Descriptions. The name "Chase" on your Robe is a Guarantee of Quality.

*WRITE FOR FULL PARTICULARS*

**L. C. Chase & Co.,** Boston, New York, Chicago, San Francisco

## Don't Lag Behind in the March of Progress

To cling to the four-cycle type of engine when the two-cycle is achieving such a triumph is to fall behind. Lose no time in finding out all about

**THE WILLET TWO-CYCLE ENGINE**

admittedly the best of its type on the market. You will find it a marvel of simplicity, and in addition the new patented Rotary valve makes it silent, powerful and flexible. This valve is self-grinding, adjusting and needs no attention, allowing a full and positive charge to enter the engine regardless of speed or condition. Let us give you full particulars.

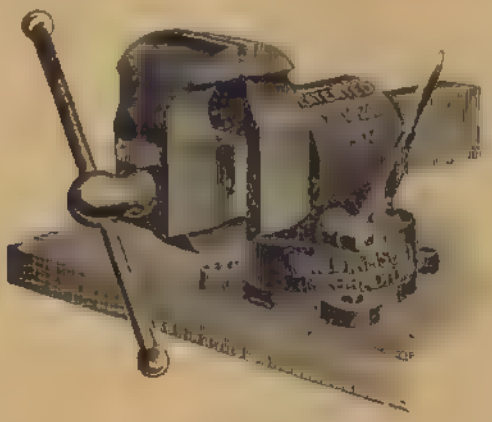
MADE IN SIZES FROM 20 TO 40 H. P.

**Willet Engine & Carburetor Co.,** 764 Ellicott Square BUFFALO, N. Y.

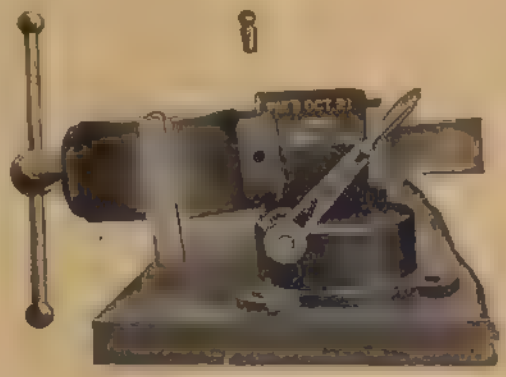
# Williamson Bench Vises

## UNIVERSAL, DOUBLE SWIVEL

This Vise revolves upon two distinct complete circles adjusting itself to any degree of these circles, quickly and positively, by the action of one lever, obviating the necessity of removing the work from the vise and giving to the operator any angle of adjustment he desires, in either or both of the circles.



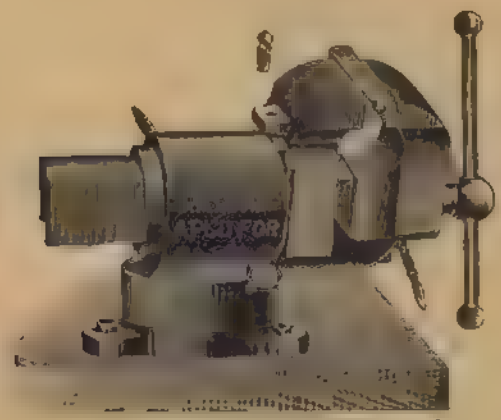
Parallel Jaw



Swivel Jaw

| No. | Length of Jaws, in. | Jaws Open, in. | Weight Lbs. | Each |
|---|---|---|---|---|
| D– | 3 | 4 | 27 | $12 00 |
| E– | 3½ | 5 | 42 | 14 00 |
| F– | 4 | 6 | 64 | 17 00 |
| G– | 4½ | 7 | 90 | 20 00 |
| H– | 5 | 8 | 120 | 25.00 |
| I– | 6 | 10 | 200 | 35 00 |

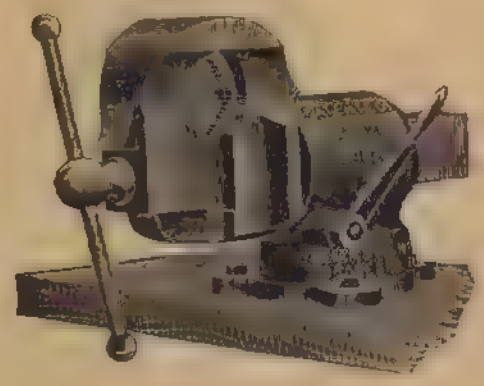
| No. | Length of Jaws, in. | Jaws Open, in. | Weight Lbs. | Each |
|---|---|---|---|---|
| T– | 3½ | 4 | 35 | $14 00 |
| R– | 3¾ | 6 | 68. | 18 00 |
| O– | 4¼ | 7 | 103. | 21.00 |



Swivel Jaw, Quick Acting

One turn of the Screw fastens the Jaws on the work, and one turn of the Screw backward releases the work from the Jaws.

| No. | Length of Jaws, in. | Jaws Open, in. | Weight Lbs. | Each |
|---|---|---|---|---|
| S– | 5½ | 9 | 154 | $32.00 |



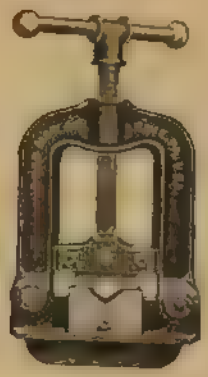
Combination Pipe

When threads are to be cut the vise can be quickly thrown into any position necessary to cut same, with free swing of the arms on the stock, without loosening or removing the joint of pipe.

| No. | Length of Jaws, in. | Holds Pipe | Weight lbs. | Each |
|---|---|---|---|---|
| K 2– | 4 | ¼ to 2 in. | 75 | $18.00 |
| K 3– | 4½ | ¼ to 3 in. | 110 | 23.00 |

# Pipe Vises

## SUNSET



| No. | Takes Pipe | Wt. Ea. | Each |
|---|---|---|---|
| 4 | ⅛ to 2½ in. | 11 lbs. | $ 6.50 |
| 5 | ⅛ to 3½ in. | 14 lbs. | 8.00 |
| 6 | ⅛ to 4½ in. | 20 lbs | $10.00 |

## ARMSTRONG

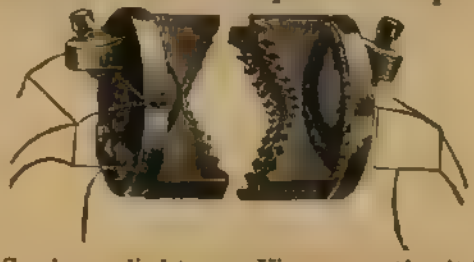
| No. | Takes Pipe | Wt. Ea. | Each |
|---|---|---|---|
| 00 | ⅛ to 2 in. | 5 lbs | $ 6.00 |
| 0 | ⅛ to 2½ in. | 8 lbs. | 8.00 |
| 1 | ⅛ to 2½ in. | 14 lbs. | 10.00 |
| 2 | ⅛ to 4½ in. | 22 lbs. | 20.00 |
| 3 | ⅛ to 6 in. | 46 lbs. | 30.00 |

## VULCAN CHAIN

Made from Wrought Steel
Drop Forged Jaws, Tempered

| No. | Takes Pipe | Wt. Ea. | Each |
|---|---|---|---|
| 102 | ⅛ to 4 in. | 10 lbs. | $ 5.00 |

# Peerless Pipe Grips



All Cast Steel. Can be applied to any Vise, converting it into a Pipe Vise

| No. | | | Each |
|---|---|---|---|
| 1 | Fits any Vise with Jaws from 3 to 4¾ in. | Holds Pipe ¼ to 2½ in. | $ 2.50 |
| 2 | Fits any Vise with Jaws from 5 to 6¼ in. | Holds Pipe ¼ to 5 in. | 2.75 |

# Winchester Rifles

## MODEL 1907, SELF-LOADING

**Take Down—.351 Caliber—20 in. Barrel, Plain Pistol Grip Stock, 6 Shots**

**Round** Barrel. Weight 7¾ Pounds ..... Each $28.00

**For Extras to Above, See Page 1729. For Parts, See Page 1795**

## SINGLE SHOT

Will be made for the cartridges named in the list below and the standard lengths and sizes of barrels as given will be sent on orders unless otherwise specified

| Cartridges | Standard Length of Barrel | Standard Size of Barrel | Weight of Rifle with Octagon Barrel, about | Other Sizes of Barrels which can be Furnished |
|---|---|---|---|---|
| **Rim Fire** | | | | |
| .22 Short, | 24 in. | No. 1 | 6 lbs., 14 oz. | No. 2, 3, 4 or 5 |
| .22 Long, | 24 in. | No. 1 | 6 lbs., 14 oz. | No. 2 3, 4 or 5 |
| .22 Long Rifle, | 24 in. | No. 1 | 6 lbs., 14 oz. | No. 2 3, 4 or 5 |
| .22 Winchester. | 24 in. | No. 1 | 7 lbs., 2 oz. | No. 2, 3, 4 or 5 |
| 25 Stevens, | 26 in. | No. 1 | 7 lbs. | No. 2 |
| .32 Short, | 26 in. | No. 1 | 6 lbs., 12 oz. | No. 2 |
| .32 Long, | 26 in. | No. 1 | 6 lbs., 12 oz. | No. 2 |
| **Center Fire** | | | | |
| .22 Win. Single Shot, | 26 in. | No. 1 | 7 lbs. | No. 2, 3, 4 or 5 |
| .25-20 Single Shot, | 28 in. | No. 1 | 7 lbs. | No. 2 or 3 |
| .30 U. S. Army, | 30 in. | No. 3 | 9¼ lbs. | |
| .32 W. C. F., | 28 in. | No. 1 | 7 lbs. | No. 2 or 3 |
| .32 Ideal, | 28 in. | No. 1 | 7 lbs. | No. 2 or 3 |
| 32-40, | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .38 W. C. F., | 28 in. | No. 1 | 6½ lbs. | No. 2 or 3 |
| .38-55, | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .38-56 W. C. F., | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .38 Express, | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .40-70 Straight, | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .40-70 Ballard, | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .40-90 Ballard, | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .40-90 Sharps, | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .40 Express, | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .40-60 W. C. F., | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .40-65 W. C. F., | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .40-82 W. C. F., | 30 in. | No. 3 | 9½ lbs. | No. 2, 4 or 5 |
| .44 W. C. F., | 28 in. | No. 1 | 6½ lbs. | No. 2 or 3 |
| .45-60 W. C. F., | 30 in. | No. 3 | 9 lbs. | No. 2, 4 or 5 |
| .45-75 W. C. F., | 30 in. | No. 3 | 9 lbs. | No. 2, 4 or 5 |
| .45-90 W. C. F., | 30 in. | No. 3 | 9 lbs. | No. 2, 4 or 5 |
| .45-70, | 30 in. | No. 3 | 9 lbs. | No. 2, 4 or 5 |
| .45 Express, | 30 in. | No. 3 | 9 lbs. | No. 2, 4 or 5 |
| .50-95 Express, | 30 in. | No. 3 | 9 lbs. | No. 2, 4 or 5 |
| .50-110 Express, | 30 in. | No. 3 | 9 lbs. | No. 2, 4 or 5 |

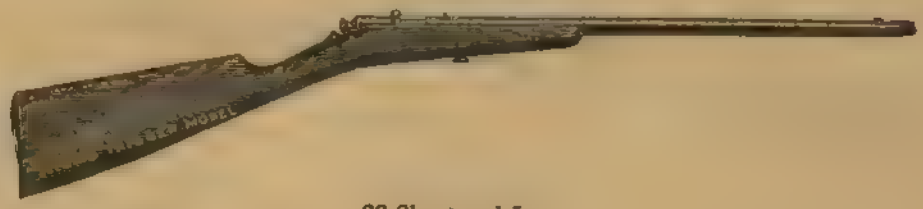
For guns with extra length of barrels over those given above add $1 00 for every two inches
.22 calibre barrels can be made only up to 30 inches in length. Other calibers can be furnished up to 36 in. only.
An extra charge of $2 00 will be made for No 4 barrel. An extra charge of $5 00 will be made for No 5 barrel.
Set Triggers for all guns taking Rim Fire Cartridges and for .22 W. C. F. .25-20, .32 Ideal, .32 W. C. F., .38 W. C. F., and .44 W. C. F., $2.00. Schuetzen Double Set Triggers, $6.00.
No Rifles of this Single Shot Model Carried in Stock From Factory only.

**For Parts, see Pages 1791 and 1792**

# Winchester Rifles

## THUMB TRIGGER MODEL

Take Down



.22 Short and Long

Round Barrel, 18 in., Weight about 3 Pounds ..... Each $ 3 50

No Deviations Made from Regular Rifle

## MODEL 1902

Take Down

.22 Short and Long

Round Barrel, 18 in., Weight about 3 Pounds ..... Each $ 5 00

No Deviations Made from Regular Rifle

## MODEL 1904

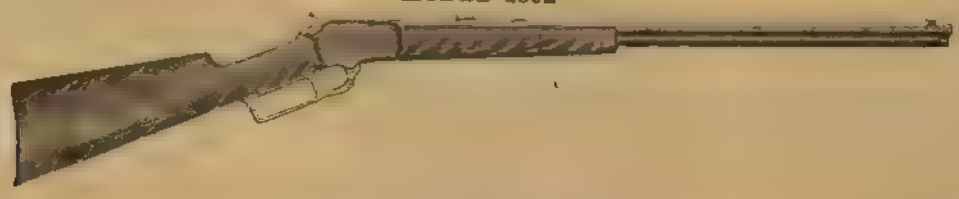
.22 Short and Long

Round Barrel 21 in., Weight 4 Pounds, Sporting Shaped Stock, Adjustable Sights, Blue Steel Butt Plate ..... Each $ 6.00

For Parts, See Pages 1792, 1793

# Marlin Repeating Rifles

## MODEL 1892



.22 and .32 Caliber

**Model 1892**– 22 Caliber, without Adjusting, Shoots 22 Short, 22 Long, 22 Long Rifle Rim Fire Cartridges

**Model 1892**– 32 Caliber, without Adjusting, Shoots .32 Short and .32 Long Rim Fire Cartridges, and by Changing Firing Pin, .32 Short and .32 Long Center Fire Cartridges

| Length Barrel, in. | 24 | 26 | 28 |
|---|---|---|---|
| Rifle, with **Round** Barrel ..... Each | $13.75 | 15 25 | 16.75 |
| Rifle, with **Octagon** or **Half Octagon** Barrel ..... Each | 14.75 | 16.25 | 17.75 |

24 in., which is Regular Length, Only, Carried in Stock

For Extras to Above, See Page 1729

For Parts, See Page 1798

# Wright & Ditson Footballs

RC

## Rugby

| | | Ea. |
|---|---|---|
| RC | – Official Championship Rugby, selected [illegible] from which each has been [illegible] pure gum rubber bladder, lacing needle and pump | $5.00 |
| R1 | Inter-Collegiate Rugby, [illegible] pump and lacing needle | 3 50 |
| R5 | [illegible] guaranteed bladder and [illegible] regulation size | 3 00 |
| R6 | —Grain [illegible] of best quality, guaranteed bladder and rawhide lace regulation size | 2 50 |
| R7 | —[illegible] leather, guaranteed bladder and rawhide lace regulation size | 2 00 |
| 50 | —Pebble grained leather [illegible] with guaranteed bladder, regulation size | 1 25 |

## Soccer and Association

| | | Ea. |
|---|---|---|
| 395 | —Imported Englose pebble grain leather guaranteed official weight, size and shape, pure para rubber bladder, lacing needle and pump | $5.00 |
| G | —Gaelic Football, imported English leather pure para rubber bladder, lacing needle and pump | 5 00 |
| 5A | Association Match [illegible] imported English leather pure para rubber bladder | 3 50 |
| 24A | —American grain [illegible] correct shape and size, rawhide lacing pure para rubber bladder | 3 00 |
| 25A | —Pebble grain leather regulation size, guaranteed bladder | 2 50 |
| 27A | —Full size [illegible] football, [illegible] dressed buck, pure gum bladder | 2 00 |

## GUARANTEED FOOT BALL BLADDERS

GUARANTEE ON PURE [illegible] BLADDERS [illegible] a guarantee applies only during the season in which ball is purchased.

### Association

| | Per Doz. |
|---|---|
| OA—For G and 395 Balls | $12.00 |
| SB—For 25A, 27A and 24A Balls | 9.00 |

### Rugby

| | Per Doz. |
|---|---|
| OR—Special Rugby for RC Ball | $ 5 00 |
| R —For R1 and R5 Balls | 10 80 |
| 4 —For R6, R7 and 50 Balls | 9 00 |

## CLUB INFLATORS

| No. | | Per Doz. |
|---|---|---|
| 2 | Club Size, Length Closed, 13 in. | $6 00 |

## SHIN GUARDS

| No. | | Per Pair |
|---|---|---|
| 60 | Black leather, backed with rattan reeds and felt padding, light weight | $1.50 |
| 12 | [illegible] | 1 00 |
| 9 | Canvas, length 11 in., reed and felt padding | .50 |
| 8 | Canvas, length 9 in., reed and felt padding | .40 |
| FS | Special guard of fibre, molded to shape of leg. Made to wear under stocking | 1 00 |

## HEAD HARNESS

| | | Ea. |
|---|---|---|
| A | Firm black leather, molded to shape, perforated for ventilation | $4.00 |
| B | Soft black leather, felt padded, molded ear pieces, canvas lined | 3 00 |
| C | Soft leather top, mole skin sides and ear pieces, felt padded | 2.00 |
| DV | Brown leather, without neck extension, felt padded | 1.00 |

## MORRIL NOSE MASK

Made of Finest Rubber, with no Wire or Metal in its Construction

| No. | | Per Doz. |
|---|---|---|
| 0 | Men's Adjustable Mouth Piece | $ 6.00 |
| 0B | Boys' Adjustable Mouth Piece | 6.00 |
| 1 | Men's Size | 6 00 |
| 1B | Boys' Size | 6.00 |

## RUBBER MOUTH PIECES

| No. | | Per Doz. |
|---|---|---|
| 2 | Protection for Mouth and Teeth | $ 3 00 |
| A | Adjustable Mouth Piece for Nos. 0 and 0B Masks | 3 00 |

## WRIST SUPPORTERS

| No. | | Per Pr. |
|---|---|---|
| 100 | Long strap and buckle, tan | $ 3 00 |
| 200 | Double strap and buckle, tan | 4 80 |
| 300 | Laced supporter, black or tan | 3 00 |
| 400 | Pigskin | 6 00 |

## ANKLE SUPPORTERS

| No. | | Per Doz. Pairs |
|---|---|---|
| H | –Soft tan leather | $12 00 |
| SH | Sheepskin | 6 00 |
| CH | Black Duck | 9 00 |

# Wright and Ditson Striking Bags

Bell Shape

### Pear Shape

| No. | Each |
|---|---|
| 33–Best quality selected tan vealskin, designed for professional use. Lined with [illegible] and welted seams, triple stitching, best pure gum rubber bladder | $6.00 |
| 32–Oak tan leather, cloth lined, triple stitching, welted seams, pure gum rubber bladder | 5.00 |
| 31–Choice black tan leather, cloth lined, welted seams | 4.50 |
| 30–Brown Yucatan leather, cloth lined, triple sewed seams | 4.00 |
| 29–Wine tan leather, cloth lined, brown welting, triple stitching | 3.00 |

Pear Shape

| | |
|---|---|
| 3P –Medium size, good quality leather and bladder | 2.00 |
| 2PA–Small size, good quality leather and bladder | 1.50 |

### Bell Shape

| No. | Each |
|---|---|
| 28–Selected tan vealskin, especially adapted for fast work, 32 in. size, triple stitched, welted seams, best pure gum rubber bladder | $5.00 |
| 27–Napa Green stock, fancy white welts, triple stitched, 32 in. size | 4.00 |
| 26–Yucatan brown leather, welted and triple stitched, 32 in. size | 3.50 |
| 25–Oak tan leather, triple stitched seams, size 32 in., pure gum bladder | 3.00 |
| 24–Olive green leather, triple stitched, red welted seams, Paragon rubber bladder | 2.50 |
| 23–Wine tan leather, triple stitched and taped seams, Paragon rubber bladder | 2.25 |
| 22–Green tan leather, pure rubber bladder, 28 in. size | 2.00 |
| 21–Gold dressed buck, pure rubber bladder, 28 in. size | 1.50 |

### Double End Bags

| No. | Each |
|---|---|
| 26D–Yucatan brown leather, 32 in. size, welted and triple stitched, Paragon bladder | 3.50 |
| 25D–Oak tan leather, 32 in. size, welted and triple stitched, Paragon bladder | 3.00 |
| 24D–Olive green leather, red welted seams, triple stitched, Paragon bladder | 2.50 |

7 and B

### STRIKING BAG BLADDERS

| No. | Each |
|---|---|
| OS–Large size | $1.25 |
| 7S–Side Stem, for bags 29, 30, 31, 32 and 33 | 1.00 |
| 7 –Top Stem, for bags 24, 25, 26, 24D, 25D, 26D, 27 and 28 | 1.00 |
| BS–Side Stem, medium size | .75 |
| B –Top Stem, for bags 21, 22 and 23 | .75 |

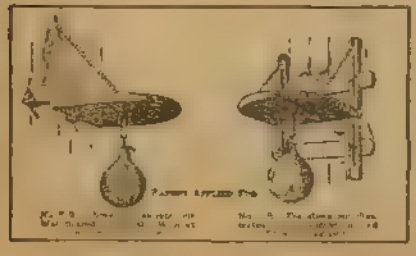
OS, 7S and BS

### STRIKING BAG SWIVELS

| No. | Per Doz. |
|---|---|
| 12–Japanned | $ 3.00 |

| No. | Per Doz. |
|---|---|
| 309–Nickel Plated | $ 6.00 |

| No. | Per Doz. |
|---|---|
| 337–Nickel Plated | $ 9.00 |



### STRIKING BAG PLATFORMS

| | Each |
|---|---|
| FR–Striking Bag Platform, simple and firm in construction. Takes up very little space. Complete, without bag | $6.00 |
| CR As FR, only adjustable in height. More suitable for clubs or when more than one uses it. Complete, without bag | 8.50 |

# "Desert" Water Bags

Regular Style

Cools water **Without Ice**—Keeps it very cool in any temperature, fresh and palatable for several days. Principle: Capillary Attraction—Evaporation.

A specialty of superior merit

It excels in the most important features

Its favorable reputation and actual worth to consumers has made it very popular with all out-of-door workers and travelers

All "Desert" Bags guaranteed

Hang them anywhere in the blazing sun.

Expose to open air circulation or draught

The material is pure (imported) Flax, woven into a durable fabric especially for "Desert" Water Bags

Used by

Farmers, Sheep and Cattle Rangemen, Miners, Prospectors, Teamsters, Campers, Motor Tourists, Boatmen, Vineyard and Orchard Hands, Millmen, Construction Crews, Hunters, Surveyors, Timbermen, Railroad Sectionmen. Also for household use

Use a faucet bag for demonstrating to customers

Faucet Style

| Capacity | | Measurements | Net Weight Per Doz. | Per Doz |
|---|---|---|---|---|
| 1 gal. | Sporting | 10 x12 in. | 6 lbs. | $13 50 |
| 2½ " | Regular | 11½x17 in. | 9½ lbs. | 17 00 |
| 3½ " | " | 12½x23½ in. | 12 lbs. | 24 00 |
| 5 " | " | 17½x23½ in. | 15 lbs. | 30 00 |
| 3½ " | Faucet | 12½x23½ in. | 17 lbs. | 2 00 |
| 5 " | " | 17½x23½ in. | 21 lbs. | 10 00 |

# Folding Ironing Boards

No. 1915

Made of the best all clear selected kiln-dried stock, the only dovetailed Board made reinforced at top and all rounds are securely fastened. Weight 20 lbs each.

| No. | Per Doz. |
|---|---|
| 1915– | $24.00 |

# Meat Safes

Made of kiln-dried clear stock, no sagging of doors, every joint a tenon, top and back tongue and groove joints, will not warp. Wire cloth stained black, wood work lemon color.

| No. | Size in. | Weight each | Each |
|---|---|---|---|
| 0– | 12x18x10 | 10 lbs | $1 60 |
| 1– | 18x23x10 | 16 lbs | 2 20 |
| 2– | 22x24x13 | 20 lbs | 2.75 |
| 3– | 18x30x18 | 35 lbs With double swing doors | 7.00 |

Packed in crates of two for shipping. Do not sell less than crate lots as the cost of repacking would destroy profit

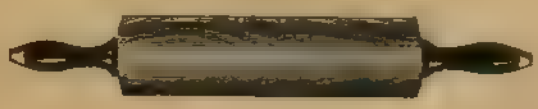
# Wooden Ware

## GROOVED SPADES

| No. | Per Doz. |
|---|---|
| 6–Size, 8x10 in. | $ 1.00 |

Three Doz. in a Box

## ENAMELED HANDLE ROLLING PINS



| Size | Per Doz. |
|---|---|
| 12x2⅝ in. | $ 3.00 |

One Doz. in a Box

## ROLLING PINS

Hardwood, Revolving Handles

| Size | Per Doz. |
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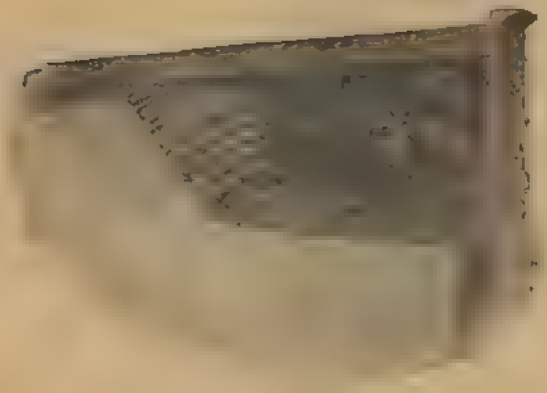
| 12x2¼ in., Plain Handle | $ 2.00 |

One Doz. in a Box

# X-Ray Reflectors

Silvered Inside Green Enameled Outside



POKE BONNET

[illegible] Plug.

| Catalog No. | Width | Length | Each |
|---|---|---|---|
| 750 | 7 in. | 14 in. | $ 6.50 |

HELMET REFLECTOR

[illegible] Special Shade Holder.

| Catalog No. | Diam. | Height | Each |
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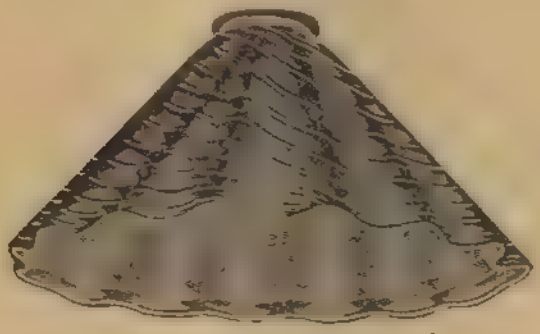
| 755 | 12 in. | 11½ in. | $ 6.00 |



DEEP CONE REFLECTOR

For use over Billiard Tables, Counters and general illumination.

| Catalog No. | Diam. | Height | Each |
|---|---|---|---|
| 700 | 10 in. | 5½ in. | $ 1.00 |

PARABOLA REFLECTOR

For Desks, Typewriters, etc.

| Catalog No. | Diam. | Height | Each |
|---|---|---|---|
| 525 | 6½ in. | 3½ in. | $ 1.00 |

CEILING REFLECTORS

| Catalog No. | Holder | Diam. | Height | Std. Pkg. | Each |
|---|---|---|---|---|---|
| 820 | 1⅛ in. | 5 in. | 1 in. | 120 | $ 0.50 |

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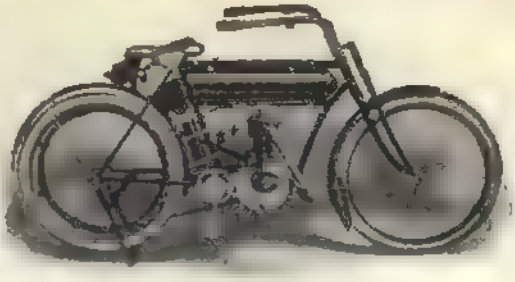

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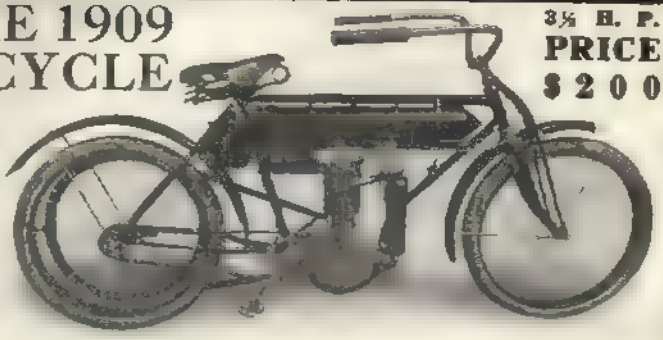

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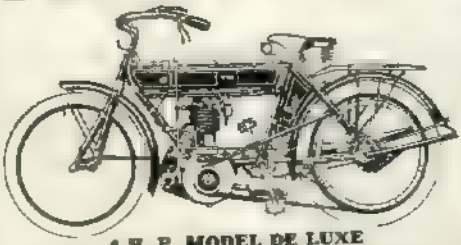

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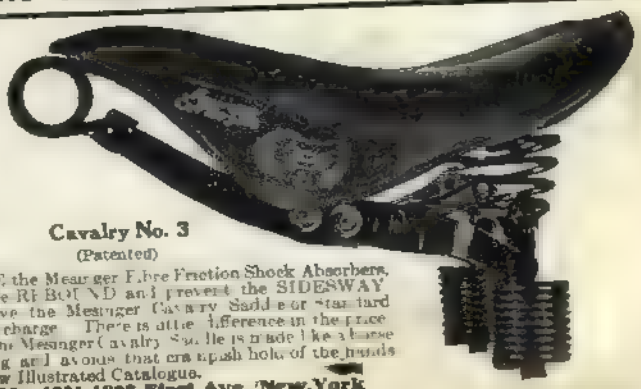

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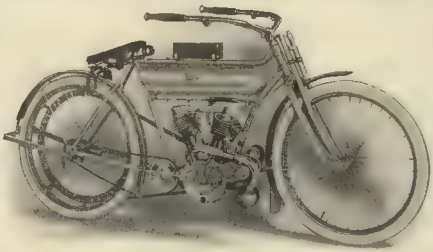
# YALE 1910 MODELS



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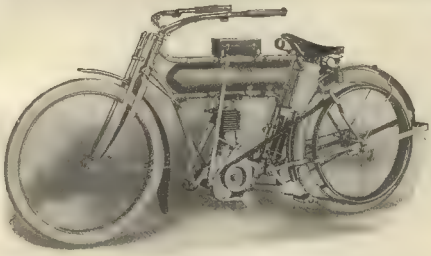

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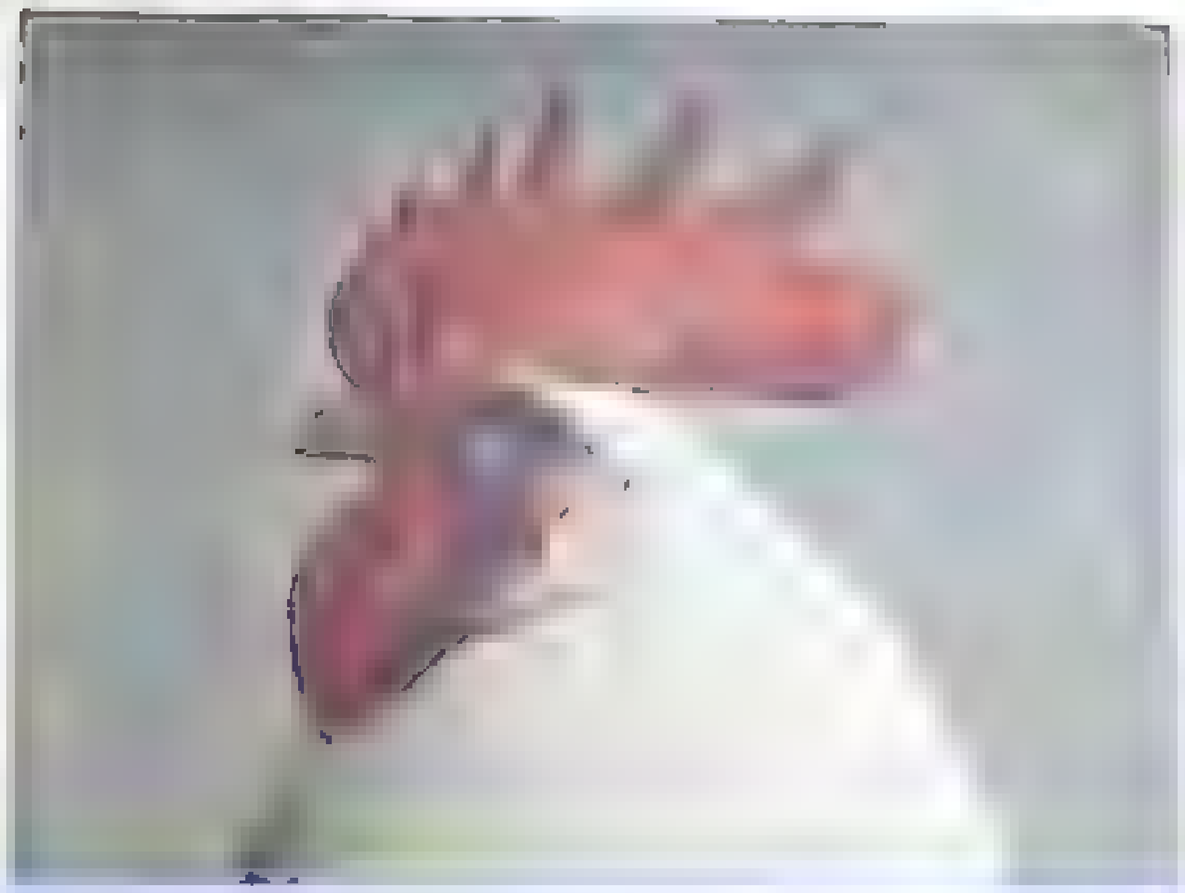


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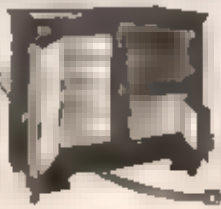

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# WAITING FOR PEARY

## BY GEORGE KENNAN

STAFF CORRESPONDENT OF THE OUTLOOK

IN the course of a somewhat adventurous life, many extraordinary announcements have been made to me by telephone; but few of them have given me a keener or more pleasurable thrill of excitement than that contained in the words "Peary has reached the Pole." I had long anticipated that the North Pole would some time be reached, and had long hoped that Peary would be the man to reach it; but the sudden announcement that my anticipations had been realized and my hopes fulfilled found me almost as unprepared as I should have been for the news that communication had been opened with the planet Mars.

Early the next morning, as I sat by an open fire in my country house reviewing in imagination long-past experiences in the Far North that had been recalled by Peary's achievement, I received a telegram from The Outlook asking me to act as its representative at Sydney, C. B., when the Roosevelt should arrive there from the Polar Sea. I ran hastily through my Arctic index, looked up my latest circumpolar map, packed my round-the-world suit-case, and, joining a magazine editor and a publisher at the village pier, took the first boat for Iona, the nearest station of the Intercolonial Railway on Cape Breton's beautiful inland sea.

An hour and a half later we entered the parlor car of the train for Sydney. The car was filled with keen-eyed, alert-looking young men in tweed suits and traveling caps, some of them looking out over the blue water of the Bras d'Or and asking to be shown the residence of Alexander Graham Bell; some gathered in little groups, holding consultations, apparently, over telegrams or charts; and a few writing busily on pencil-pads held in their laps, and now and then crumpling or tearing up an unsatisfactory sheet of manuscript and throwing it on the paper-littered floor. To the most inexperienced eye it would have been apparent that this was a party of trained professional reporters going somewhere on an important "assignment." In less than ten minutes I had renewed acquaintance with four men whom I had last seen in places as far apart as Santiago de Cuba; Fort de France, Martinique; Tokyo, Japan; and the dining-room of the "Ends of the Earth Club" in New York City. There, too, were Mr. Bridgman, of the Peary Arctic Club, and Mr. Evelyn Baldwin, of the Baldwin-Ziegler Polar Expedition, whose interest in Peary's achievement was even greater than that of the special correspondents.

Sydney, which has been Commander Peary's port of departure and return for nearly thirty years, is chiefly noted for its mines of bituminous coal and its great manufactories of iron and steel; but a visitor who sits at one of the windows of the Sydney Hotel and looks out over the tranquil water of the landlocked harbor sees nothing whatever to remind him that he is in one of the most important industrial centers in the Maritime Provinces. But it is not the Sydney of coal, iron, and steel, nor the Sydney of attractive summer residences, nor the Sydney of picturesque Nova Scotian scenery, that now holds the expectant attention of the world: it is the Sydney of Commander Peary—the Sydney that was the last to bid him good luck and good-by when he sailed away into the mysterious North, and that will now be the first to welcome and congratulate him when he returns.

No sooner had the special correspondents got their bearings in Cape Breton and oriented themselves with reference to Newfoundland and Labrador, than they began to get together in little professionally segregated groups and devise plans to circumvent one another in opening communication with the Roosevelt and getting a "scoop" on Commander Peary's "follow story." The first group to vanish suddenly and mysteriously was that of the Associated Press men, who secretly chartered a small but powerful ocean tug and sailed away into the stormy sea between Cape Breton Island and Newfound-

be expected. There were some very active members. One woman, for example, was the president of the Home Missionary Society, the chairman of the Pastors' Aid Society, and teacher of the infant class. One man was the president of the Men's Club, the superintendent of the Sunday-school, and the chairman of the Pew Committee. Twenty active, prominent women in the whole membership? No, hardly that—not prominent, at least. Twenty active, prominent men? No, there might be ten, if those attending to the business side of church affairs were counted in. But really, with such a good, strong, efficient staff as they proposed to give the pastor, what difference did it make in the end?

The clergyman shook his head. "In my home church," he said, "I have men and women to help me who love the church and work for it. I have a paid worker or two, very valuable—in their special work. But they do not represent the personal equation. You offer me money—money enough to buy all your Christian service done for you. I want men and women, not money." And he refused the call forthwith, on these grounds.

Was he not wise? Yet how few churches to-day have a sufficient number of members who give personal service? The men, in many of them, have long ago thrown most of the work upon the women's shoulders. That was all very well when a woman's time was of no value, commercially speaking. But nowadays, when so many women of the ablest type are drawn into business life, church work suffers for lack of their volunteer energy and staying power, which used to be freely at its service any day in the week. All the paid specialists in the world cannot make up the lack of the personal consecration of each member to the service of God and man. It is not better doctrine the churches need to-day—it is the living sacrifice of their men and women in the cause of Christ. To have one man fill three positions, each needing all the thought and effort he can spare—is not that crippling to each department? To have one woman bear three burdens of work, each of them asking for all the powers she can devote to it—is that not bound to spell failure all around?

The tendency toward the professional worker and the salary is not an unnecessary and gratuitous one. It comes out of conditions that leave no choice. Where volunteer charity refuses to devote itself, professional social workers must step in. Nobody questions their tremendous value and the thorough way in which they do things. But how about the men and women who are losing or refusing the chance to consecrate their lives to the service of the poor, the suffering, the oppressed? How about the spiritual life of the churches who are paying deaconesses and Sunday-school teachers to do what should be done by the members? All over America there are devoted workers who have given themselves to noble effort for God and man. Having money, having time, they have consecrated both, and their lives are blessed both to themselves and others in consequence. They are precious, but they are far too few. Is it not time for them to be reinforced, not by money in the plate, not by checks for institutions, but by the personal dedication of some of the rest of us?

land with the intention of intercepting Commander Peary on his way south, or going through to Battle Harbor, Labrador, in search of him. At last accounts these journalistic adventurers were struggling up the rugged coast of Newfoundland toward the Strait of Belle Isle with a heavy sea breaking over their little vessel fore and aft, in sheets of spray. Soon after the disappearance of the Associated Press men I missed the representative of the United Press, but whether he had followed the example of his rivals or not I could not ascertain. Most of the correspondents decided that it would be safer to await Peary's arrival here than to go north in search of him, because if they should take the latter course they would run the risk of passing him unseen, either in fog or in the darkness of night. For two or three days, therefore, they thronged the writing-room and lobbies of the Sydney Hotel, sending and receiving telegrams, scribbling notes, or gathering in little groups to discuss the probable reason for the detention of the Roosevelt at Battle Harbor. The tedium of waiting was relieved for them a little by a personally conducted excursion to the great mills of the Dominion Steel Company, and by an invitation to visit and inspect the French cruiser Isly, which happened to be lying in the harbor just opposite the town.

On Saturday evening Mrs. Peary arrived with her children from the coast of Maine, and this created another ripple of interest. We did not have an opportunity to see her until the following morning, when she obligingly consented to be photographed with all the newspaper men on the steps of the hotel piazza. It happened to be the sixteenth anniversary of her daughter's birth, and as daughter and mother—two young women of equal height—stood side by side, out of doors, in the searching sunshine of a glorious autumnal morning, some of us thought that, in spite of the strain of separation, fear, and dread that Mrs. Peary has been under during nearly the whole of her married life, she might easily be taken for her daughter's sister.

In order to avoid the loss of time that would result from an attempt to deal with the correspondents separately, Mrs. Peary agreed to meet them all together twice a day in the parlor of the hotel, and to give them at these stated hours any news from her husband that she might receive. But she did not have to meet them all many times. Thirty-eight of them soon became tired of hanging about the hotel with nothing to do, and on Monday afternoon they went to North Sydney, embarked on an old transformed passenger steamer named the Tyrian, which is now in the Government service, but which the authorities placed at their disposal, and went to sea with the intention of meeting the Roosevelt somewhere up the Cape Breton coast. It is currently reported in the hotel that the member of Parliament for this district obtained permission from the Government to send with the correspondents on the Tyrian more than a hundred of his constituents; and that he hoped to "make himself solid" with the latter by giving them this free Peary excursion. I hope, for the sake of the seagoing newspaper men, that these reports are wholly unfounded. The Tyrian now has sleeping accommodations for only ten or twelve passengers, and if she encountered a heavy swell outside, Monday night, as she probably did, the bodily and mental state of the hundred and thirty eight journalists and excursionists—most of them inexperienced landsmen—who were jammed together, without beds or bedding, in her main saloon, can better be imagined than described. The member of Parliament was perhaps farsighted and judicious enough to remain at home himself; but if he expects that his meeting the Peary excursion will increase his popularity among the constituents whom he sent on it, he is liable to be disappointed, because they may have reason hereafter to associate him with the most wretched night of their innocent lives, and when he stands for re-election they may say, "Let's vote for t' ither mon; this one sent us to meet Payry whatefer!"

As for the correspondents, such experiences are all in their day's work, and they will undoubtedly meet Peary if they stay outside long enough. But he has not left Battle Harbor yet, and the New York Times correspondent and I—the rear guard of the grand journalistic army—are still waiting for him in Sydney.

Sydney, Cape Breton Island,
September 15, 1909.

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A PROPOSED CIVIC CENTER FOR THE CITY OF CHICAGO

# THE GENESIS OF A GREAT CITY

BY

JOHN G. SHEDD

THE origin of all great cities may be expressed in one word — opportunity. The founding of a commercial metropolis or trade center is but the seizing of an opportunity, an intelligent knowledge of conditions and a prophetic grasp of the future. London, the world's greatest city, although dating its municipal charter in the eleventh century, was a city of considerable importance as far back as the first century of the Christian era. Its origin was but an opportunity embraced by the Roman conquerors for the establishment of a needed political and commercial capital, and the beautiful valley of the River Thames afforded the opportunity and made it favorable and propitious.

Other large cities of the Old World began their civic existence in a similar way, political necessity and commercial advantage making the opportunity in each case. In America, where civil liberty and the spirit of advancement are at their height, only commercial or business opportunity is considered in the founding and upbuilding of the great cities. Political capitals do not become great cities in America. Washington, the beautiful capital of the United States, takes rank in size as the fourteenth city of the country, and less than half a dozen capitals of states have reached the two hundred thousand mark in population. All the large trade centers of the country had their origin in the commercial necessities of the times — the opportunities afforded by the development of contiguous territory and the expansion of the nation as a whole.

New Amsterdam, the original New York, incorporated as a city in 1653, fully met the business requirements of its Dutch founders, although it had a population of only sixty thousand at the beginning of the nineteenth century. Its development was simply in keeping with that of the nation of which it was the commercial metropolis.

Philadelphia, which received its charter in 1701, rounded its first century with a

population of twenty-eight thousand, but it grew as rapidly as the slow growth of the country warranted.

Undoubtedly the most noteworthy example of opportunity, in the genesis and the development of a great city, is found in the origin and upbuilding of Chicago, the coming empire. They could not have foretold that within the memory of some people then living, it would become the greatest railroad center in the world and the second city in population and commercial importance in the United States, but they reasoned that the geographical

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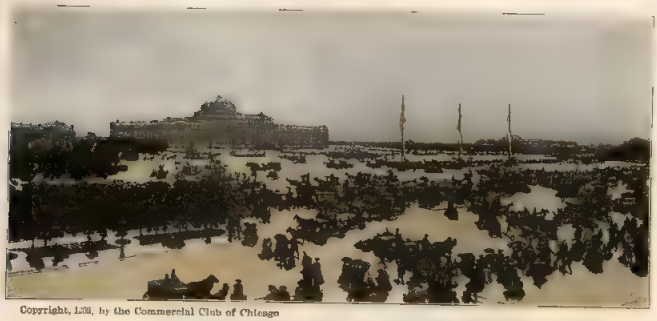
THE PROPOSED PLAN FOR THE CENTRAL PART OF CHICAGO

This shows the great piers and harbor in front of Grant Park and, in the foreground, the civic center with streets radiating from it

which began its corporate existence less than three-quarters of a century ago, and which is now the fourth city in the world. At the time Chicago received its charter (1837), there were only three states west of the Mississippi River, namely, Missouri, Arkansas and Louisiana. There were no railroads in the country west of Pennsylvania. The West was only sparsely settled, and trade centers were few in number and small in size. But the founders of the city foresaw at least something of the wonderful development that was to come to this region of the Great Lakes and the Mississippi Valley, and they drove their stakes at this point of greatest vantage to economy of the location was such as to make it a great city, and they pinned their faith to that deduction.

The real growth of Chicago — the rapid development that has challenged the world from every phase and every standpoint — did not begin until the Civil War and the settlement of certain political questions in a manner absolutely necessary for the proper development of any nation, although the city stood as a sturdy sentinel through all those years, jealously watching and aiding the pioneers in their struggles for the supremacy of the Middle West. The people who settled this productive section early became imbued with the Chi-



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THE PROPOSED PLAZA ON MICHIGAN AVENUE

West of the Field Columbian Museum of National History in Grant Park, looking east from the corner of Jackson Boulevard

cago spirit and at the same time they felt the never-failing power of the Chicago helping hand. There was a magic in this spirit and this helpfulness that made the people prosperous beyond their fondest dreams, and, in turn, impelled them to aid in the upbuilding of the great city by the lake. That was the opportunity of the

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A SUGGESTION FOR MICHIGAN AVENUE

A double roadway running to a plaza at its intersection with Twelfth Street

A PLAYGROUND IN THE RIGHT PLACE

Chicago has made a remarkable record in the number of these recreation grounds that it has placed in the poorer parts of the city

people of the Middle West, and it was seized and held as with hoops of steel. Within the average age of man they have seen Chicago grow from a city with a population of three hundred thousand to one of two million two hundred and fifty thousand, and, reckoning all the advantages in its favor and measuring its growth relatively with that of other cities, they see it ranking as the first city in the world within the present century.

The people of the great Middle West realize that without the magical influence of Chicago the present attainments of their

THE TOWER GROUP, THE UNIVERSITY OF CHICAGO

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THE PROPOSED CIVIC CENTER PLAZA AND BUILDINGS

It is planned to be built at the intersection of Congress and Halsted streets. This shows it as the center of the system of arteries of circulation and of the surrounding country

section would have been impossible. Its great central market, its matchless facilities for distribution, its advantages as a banking center, its tireless industry, its genuine thrift, and its rugged honesty, have constituted the power that has helped to lift the country into prominence and given the union some of its richest, most productive and most enlightened states.

The period of Chicago's first seventy years has largely been devoted by her citizens to the upbuilding of a great commercial metropolis. Recently some of the foremost business builders of this great city, through the instrumentality of the Commercial Club, have devoted much time to the better building of Chicago, looking farther into the future with a view of insuring order where otherwise chaos would reign. This plan should receive careful study by all interested in the city's growth, combining as it does the ideal and practical in a harmonious whole, extending from the lake to the far-away country on the north, south and west, bringing the city and its environs into one concrete, comprehensive plan worthy of the efforts of those who have given their time and talent to the work.

The genesis of Chicago is a matter of history. Her future is perhaps suggested in the words of Blanche Fearing, in her prophecy entitled "In the City by the Lake." Her song was—

Here in this splendid City by the Lake,
I dream that man has a majestic hope,
Because all elements of life and thought
Enrich her blood and stimulate her brain
Here is the world epitomized, for here
Are pulses out of every nation's heart,
And men may study mankind at their hearths.
This is to be a favorite battle-ground
For truth and error. Here, as time moves on,
Great causes will be marshaled. Times have
been
Already, when the stirring trumpet blast
Of an approaching conflict shook the world
Out of its dream of safety. Oh, then teach
All capable of bearing the bright arms
Of reason, fearless, independent thought!
If you would lead men surely angelward,
Teach them to think — not what to think, but
how.

banking houses, and the nonexistence of American commission firms — all these account for the slow development of North American commerce in Argentina. That under these conditions we have been able to sell as much as the returns show, is a proof of the superiority of the product of our industries and may give us an inkling of what might be done were the cultivation of these relations undertaken by our big American firms with their accustomed energy.

# THE RAILROADS AND THE SHERMAN ANTI-TRUST LAW

BY

SAMUEL O. DUNN

BETWEEN the two principal federal laws regulating railroads, the Sherman anti-trust law and the Act to Regulate Commerce, there is an "irrepressible conflict." They have been on the statute books together over eighteen years; and about in proportion as the railroads at any given time have obeyed the one they have broken the other. The Interstate Commerce Commission, which was created to administer the Act to Regulate Commerce, has said the Sherman law is one of the greatest obstacles to the performance of its duties. There is constant danger that the means used by railroad officers, with the sanction of the Commission, to comply with the interstate commerce law, will cause them to be prosecuted, and perhaps fined or imprisoned, under the Sherman law.

President Roosevelt repeatedly has recommended that Congress repeal the Sherman law as it applies to railroads. The Interstate Commerce Commission has urged such action. The National Industrial Traffic League, a leading organization of shippers, favors it, as did the national conference on trusts at Chicago in October, 1907. The injustice of having two conflicting laws for the regulation of railroads has continued so long because the public and public men have not understood the true situation. When they do, the American sense of fair play will cause legislation such as the President has advocated. It ought to be passed during this session of Congress.

The main purpose of the original Act to Regulate Commerce and of the Elkins and Hepburn amendments to the Act, was to stop railroad discrimination between shippers and localities. They all aim to compel the roads to treat all shippers and communities equally, with due allowance for differences of conditions. To accomplish this the interstate commerce law, as it stands now, requires changes in rates to be published, filed with the Commission, and posted at stations thirty days before they go into effect; makes the published rate the only lawful rate; prohibits rebating, and gives the Commission power to change a rate which, after investigation, it finds discriminatory, excessive or otherwise unreasonable. A violation of the law is punishable by a fine of $5,000 to $25,000, or imprisonment for not more than two years, or both.

The Sherman Act prohibits every "contract, combination in the form of trust, or otherwise, or conspiracy in restraint of trade," under penalty of a fine of not more than $5,000, or imprisonment not over one year, or both.

Superficially there seems no conflict between these provisions of the two laws; but let us see how they work.

The rates on export grain, which are among the most important rates on American railroads, easily might be so unfairly adjusted that the farmers in some sections, the grain-dealers in some markets, and the cities at some seaports, would be

ruinously discriminated against, while farmers, dealers and ports elsewhere were enriched. Such results are prevented by three agreements between the railroads. Rates on grain moving through the Atlantic ports are fixed by an agreement of the eastern trunk lines. Rates on grain passing through the ports on the Gulf of Mexico are fixed by an agreement of the western and southwestern lines. Rates on grain that may move either way are fixed by an agreement between the two groups of roads. As no road is bound to be or remain a party to these agreements, each has ample power to protect its interests and those of the shippers on its own lines. The Commission knows of all these agreements. The eastern roads in the Central Freight Association join in publishing and filing with the Commission in a single tariff the rates of all; the roads in the Western Trunk Line Committee do likewise.

Having the rates of all the roads in the same territory in one tariff is an obvious convenience to the shipper. If the rates fixed under the agreements be unreasonable, any shipper may complain to the Commission and have them changed. If the roads make an apparently unfair advance in rates, the federal courts will restrain them from collecting the higher rates pending inquiry into their reasonableness by the Commission. The rates on grain thus made are as fair to the many producers, markets and ports interested as any rates can be. They conform as perfectly to the requirements of the interstate commerce law as is possible. Nevertheless, every one of the three agreements between competing railroads under which these rates are made is in violation of the Sherman law as it was interpreted by the Supreme Court of the United States in 1897 in the Trans-Missouri Freight Association and the Joint Traffic Association cases. In the decision in the former case the court said that the Sherman Act prohibited "all agreements and combinations in restraint of trade or commerce, regardless of the question whether such agreements were reasonable or the reverse."

Before these decisions the roads in the various traffic associations made specific agreements regarding rates. Since then their officers have met, not to "agree" about rates, but merely to "confer" secretly about them. After the conferences the roads take "individual" action. Therefore, many railroad traffic officers contend, the reorganized associations are legal. But as it is clearly understood what rates will be made when the conferences end, as the rates made "individually" are the same for all, and as they are printed in the same rate-sheets, it seems tolerably plain that the associations are means for evading, not for complying with, the Sherman law as interpreted by the Supreme Court. If suits should be brought against them, the Supreme Court could hardly hold them legal without reversing its sweeping decisions in the Trans-Missouri and Joint Traffic cases.

The way that rates on export grain are made is the way that practically all competitive freight rates are made. Likewise, the effects that would be produced on rates on export grain by a strict enforcement of the Sherman law are such as would be produced on all other competitive rates if the government began to enforce that law.

Continuing to use the rates on export grain for purposes of illustration, let us suppose all shippers were satisfied with the adjustment of these rates except the dealers at St. Louis, and that they convinced a road running from there to the gulf that its own and their interests required it to make a lower rate. If the Sherman law were being enforced and obeyed, the officers of that road could not get an agreement with other interested roads to make a lower rate. It would have to take entirely independent action. Under the interstate commerce law it would have to give public notice of the reduction thirty days before it went into effect. Assuming that the former adjustment of rates was fair, the new adjustment would violate the intent of the Interstate Commerce Act by giving St. Louis an unfair advantage over Chicago, Kansas City and other grain markets, unless the roads at those places met the reduced rate. But having public notice of the reduction the other roads could promptly meet it; and in that case the road that first made the lower rate and the St. Louis market would be no better off than they were before. If this road made further reductions probably they also would be promptly met. Each road finding that public re-

ductions did not serve its purpose, but only caused equal or greater reductions by others, and the Sherman law prohibiting an agreement to put charges on a basis that would satisfy all, the temptation for the various lines to begin to try to get the advantage of each other by the worst kind of violation of the Interstate Commerce Act — the giving of secret rebates — would become great or irresistible.

The tendency of the Sherman law to cause rebating and other evils worse than those it seeks to cure, is shown by what has followed the decisions holding it applies to railroads. For four years prior to 1898 the Interstate Commerce Commission, in its reports, said almost nothing about rebating. The Trans-Missouri and Joint Traffic Association decisions in 1897 caused the dissolution or reorganization on a weaker basis of the various traffic associations through which the roads had before sought to maintain rates and prevent unfair discriminations, and in its report for 1908 the Commission said:

"The situation has grown intolerable both from the standpoint of the carriers and the public. Tariffs are disregarded, discriminations occur, and the price at which transportation can be obtained is fluctuating and uncertain. The general public gets little benefit from these reductions, for concessions are mainly confined to the heavy shippers."

Railroad heads decided something must be done to stop violations of the Interstate Commerce Act and protect railway revenues. They resorted to numerous "community of interest" arrangements, under which competing roads got representation and a voice in each other's boards of directors. In a good many instances there were actual mergers of competing lines. The law said the roads should not agree to stop cut-throat competition; and they consolidated, which was anything but what the law aimed at. One of their consolidations, that of the Great Northern, the Northern Pacific and the Chicago, Burlington & Quincy in the Northern Securities Company, was proceeded against by the government under the Sherman law and dissolved. Before the litigation the control of the Northern Pacific and Burlington was divided between James J. Hill and E. H. Harriman. The government's "victory" put the control of all three roads in the hands of Mr. Hill, where it still is. The government has never won a case against the railroads under the Sherman law without aggravating the very conditions it sought to remedy.

The Interstate Commerce Act has been better obeyed during the past four years than ever before. This has been due not merely to the fact that the government has with unprecedented vigor enforced this law, but also to the fact that it has ignored numerous violations of the Sherman Act in every part of the country that were indispensable to enable the roads to obey the Interstate Commerce Act. Professor Emory R. Johnson truly says in his "American Railway Transportation":

> Such being the nature of competition in railway affairs, some means for regulating its action are necessary if the service of railroad transportation is to be performed with profit to the company having it in charge and in accordance with the best interests of the public. . . . . Experience has clearly shown the absolute necessity for coöperation among carriers in the management of their competitive as well as their joint business. . . . Unbridled competition is intolerable alike to the railroad and the public, and must of necessity be checked. . . . If the competition among rival carriers is to be restrained they must either coöperate or consolidate. If they can not agree upon and work in accordance with business methods that will effectually restrain the force which leads to ruinous competition, they must consolidate under a single ownership or a common control. There is no other alternative.

One very bad effect of the conflict between the Sherman law and the interstate commerce law is to force the Interstate Commerce Commission, which was created to enforce the latter law, to connive at the violation of the former law. For example, the eastern trunk lines have an agreement under which they make lower rates on export business to Philadelphia and Baltimore than to New York. They do this to offset differences in the ocean steamship rates, which are higher from Philadelphia and Baltimore to Europe than from New York. Exporters at New York long have protested against this adjustment, and a few years ago the differential rate question was submitted to the arbitrament of the Interstate Commerce Commission. If the Commission had been a court, and the railroads had been charged with a violation of the Sherman

law, it doubtless would have convicted them of being in a "combination in restraint of trade." The Commission, however, ignored the bearing of the Sherman law on the matter, and held reasonable the agreement and the rates fixed under it.

Take, again, the action of the Commission about the framing of a uniform classification of freight. For convenience, freight is arranged in classes, all articles in a given class having the same rate. There are three classifications in effect, the "Official," used by the roads north of the Ohio and east of the Mississippi; the "Southern," used by the roads south of the Ohio and east of the Mississippi; and the "Western," used by the roads west of the Mississippi. The same article often is in a different class in each territory. The differences between the classifications often make it hard or impossible for a shipper sending goods from one classification territory to another to tell in advance what his total rate will be.

The Commission asked all the railroads to join in framing a uniform classification to be applied throughout the country, both for the convenience of the shipping public and to enable the Commission better to administer the interstate commerce law. The roads appointed a strong committee to do this, which is at work in Chicago now. But after a uniform classification is framed, it can not be adopted without an agreement not only as to the classes in which articles are arranged, but as to the rates to be applied on them. But such an agreement would be "in restraint of commerce," and a violation of the Sherman Act. It would be the most extensive "combination" the roads ever formed. The Commission is absolutely without power under the Interstate Commerce Act formally to require the roads to take this step, or to give them immunity under the Sherman law for taking it. At the suggestion and solicitation of a body created by Congress expressly to enforce one federal law, the railroads are preparing to break another federal law.

To keep railroad traffic officers where they can not obey one law without breaking another is the height of injustice and tyranny. As the Interstate Commerce Act is the most important federal statute regulating industry, to retain any law that hinders its administration is very inexpedient from the standpoint of the public. The remedy for this grotesque situation is for Congress to pass an Act, as President Roosevelt has recommended, to allow reasonable agreements between competing railroads about rules and rates, these agreements to be public and subject to the supervision of the Interstate Commerce Commission. Arrangements probably would then be made such as that of the Trans-Missouri Traffic Association, which the Supreme Court held illegal. Under the rules of this association a committee was appointed to make rules and rates on competitive traffic. Notice had to be given the chairman five days before each monthly meeting of any proposed change. If any railroad insisted, contrary to the views of other members, on a reduction of rates, the association could put in corresponding rates, effective the same day. Any road might at any time make a reduction to meet the competition of lines outside the association, but if it was shown any road acted in bad faith it might be fined $100.

It will be said such agreements prevent competition. If by this is meant that reductions in rates would be prevented, it is enough to recall that from 1870 to 1887, when pooling arrangements more binding than such traffic agreements were in effect, the average freight rate per ton per mile on the railroads of the United States declined from two cents to one cent. As Professor Emory R. Johnson says: "Charges did not decrease because of pools; but pools did not prevent their decline." If agreements should be made to make or maintain unreasonable rates, the Interstate Commerce Commission could prevent them from being carried out. Competitive rate-making has been practically abolished by the provisions of the interstate commerce law requiring all reductions in rates to be published thirty days in advance; but competition in giving good and adequate transportation service still exists and is much more needed in this country than rivalry in reducing rates that already, on the average, are the lowest ever made anywhere.

England and other European countries formerly legislated against agreements between competing railroads, but they long since abandoned that policy as unwise when not futile. Now such agreements

are generally permitted and enforceable by law. In many cases roads owned by the governments enter into binding pooling arrangements with competing private lines. The attempt by the Sherman law to compel cut-throat railroad competition is a survival of a public policy that is obsolete everywhere but in the United States, and of a political economy that is obsolete everywhere.

# THE LAND OF MASSACRE

BY

LEWIS GASTON LEARY

"When ye encounter the unbelievers, strike off their heads until ye have made a great slaughter among them. . . . As for the infidels, let them perish . . . and their abode shall be hell fire."— *The Koran.*

TURKEY is ablaze at both ends. In Constantinople a new sultan has just been proclaimed, and the Young Turks are busy reëstablishing the constitutional government, which was temporarily overthrown during the counter-revolution of April. As to what the outcome will be, no man dare prophesy when he knows that nearly a month must intervene between writing and publication. Before this article appears in print, all the pressing problems of Turkey may have been satisfactorily settled. On the other hand, the editorials of 1959 may still be discussing the possibilities of a limited monarchy under an Ottoman ruler.

It is comparatively safe, however, to speak of what is happening at the other side of Asia Minor in the vilayet of Adana, for the situation there is chronic. The persecutions of 1895-96 never entirely ceased, and the present outburst of arson, rape and murder back of the Gulf of Alexandretta is only the fiercer burning of a flame of racial and religious hatred which is always smouldering in districts where Moslem Turk and Christian Armenian live side by side.

Strictly speaking, there is, of course, no such place as Armenia. It is not a nation or even a vilayet (province) of the Turkish empire. Indeed, until the recent abolition of the censorship, the very name "Armenia" was forbidden to be used. But while, politically, Armenia no longer exists, there is decidedly an Armenian people, a people rivaling the Jews in the tenacity with which racial individuality is preserved in the midst of adverse circumstances. There is this difference, however, between the two nationalities: the Jews have kept their racial characteristics in spite of (or, because of ?) being forced out of Palestine to the ends of the earth, while the Armenian type has persisted most strongly in the very land of its former glory, and this in the face of centuries of oppression and unspeakable cruelty.

Probably two-thirds of all the Armenians in the world are still under Turkish rule. Before the massacres of 1895-96 there were over two hundred thousand in Constantinople alone. In Smyrna, Beirût and the other coast cities one soon gets to recognize the familiar type—short, stocky, swarthy, with flattened heads, large eyes and heavy features. They are almost without exception industrious, intelligent and keen-witted. In business ability they leave the Jews far behind and are only equalled by the Greeks, who share with the Armenians the not always enviable reputation of being the shrewdest financiers of the Turkish empire.

Their native land, which, in spite of Turkish interdict, the world still knows as "Armenia," is the territory whose approximate center is Lake Van in eastern Turkey. The high, cool tablelands are crossed here and there by loftier mountains, which culminate in Mt. Ararat—seventeen thousand feet—fifty miles northeast of the lake. This great peak,

"No," I said, with apprehensive anticipations; "but I'm afraid they weren't very well received."

"On the contrary," he replied cheerfully, "they made a great hit. The Japanese say they are true and fair, even if they are not favorable. The Foreign Office has called the Premier's attention to them, and he is having them translated so that he can read them."

A few days later I chanced to meet Count Katsura, for the first time in several weeks, at the American Legation. He greeted me with more than usual cordiality, grasped me warmly by both hands, expressed approval of my Korean articles, and, turning to Minister Griscom, said, with emphasis, "This is a true friend of Japan."

Such a large-minded way of looking at fair but unfavorable criticism was an absolutely new thing in my experience, and it surprised me even more than the advice that Count Katsura gave me when I saw him first. But there was still another surprise in store for me. When I came to Japan I brought a letter of introduction to Marquis (afterward Prince) Ito. In accordance with Japanese custom, I left it personally at his house, with the expectation that he or his secretary would notify me when it would be convenient for him to see me. Week after week passed, however, without bringing any request from him to call, and, concluding, at last, that he did not particularly care about meeting newspaper men from abroad, I abandoned the hope of making his acquaintance and sailed for Manchuria.

In the year and a half that followed I did not happen to be brought into contact with Marquis Ito, and in all probability I should never have met him if I had not written the article on "The Japanese in Korea." That, apparently, attracted his attention, and, after quoting parts of it with approval in an address that he made to the Tokyo Chamber of Commerce, he sent me an invitation to dine with him. It is a fact which is rather creditable, I think, to the Japanese character that a foreign newspaper man could thus win the confidence and approval of the Prime Minister and make the acquaintance of the most distinguished of the Elder Statesmen through hostile but fair and temperately expressed criticism of Japanese methods

I afterwards saw Marquis Ito a number of times before he left Japan to become Resident-General in Seoul, and had several long talks with him about China and Korea and the policy that Japan ought to pursue in the latter country. He impressed me as a man who combined vast experience, sound judgment, and penetrating foresight with the most winning simplicity of manner and great natural kindliness of dispocition. Like most Japanese, he could probably have been hard, inflexible, and pitiless in any matter that involved honor or duty; but his references to other men and other nationalities seemed to me singularly fair and sympathetic, and I never heard him speak bitterly, contemptuously, or slightingly of any person or any people. He admitted with regret that Japan had made many mistakes in Korea, but he hoped to correct them and to give the Koreans a government that would make for their ultimate prosperity and happiness.

"They seem to think," he said one day, "that they have hitherto been an independent nation, and that we Japanese have deprived them of their ancient liberties; but historically such is not the case. Korea was for centuries a dependency of China, and all the national freedom she has ever had she owes to us. When the war with Russia broke out, we were compelled to assume control in the peninsula, in order to preserve our own independence, but we aim to educate the Koreans and help them to a freer national life rather than to oppress them and exploit them for our own benefit. You are trying to do the same thing in the Philippines, and you ought to understand. That Korea will ultimately be a source of profit to us is quite likely; but if so, it will be because we shall have made the Koreans prosperous. Exploiting a country of which you happen to have gained control, without regard to the welfare of its inhabitants, is a most short-sighted policy. First make the people rich, and then they will be profitable to you."

In his talks with me, as well as in the public speeches that he made about the same time, Marquis Ito expressed the utmost sympathy with the Koreans and

A PHOTOGRAPHIC EPITOME OF THE SITUATION IN MANCHURIA
Chinese, Japanese, and European. A chance group at a race meeting

the strongest possible desire to promote their welfare. In an address that he made to the journalists of Tokyo just before going to Seoul to assume the duties of Resident-General he said:

"The population of Japan is increasing with great rapidity, and it is only natural that it should overflow into Korea. But, unfortunately, the behavior of our people in that country has hitherto been bad. They have put the greatest indignities upon the Koreans, and the latter have simply had to suffer with tears in their eyes. The people guilty of such conduct constitute, it is true, only a small part of the whole Japanese population; but they must be rigorously controlled, because the Imperial Government is now responsible for the Korean administration. When I assume the duties of my position as Resident-General, I shall give adequate protection to Japanese who are engaged in legitimate enterprises in Korea, but I shall take all necessary measures for dealing summarily with *mauvais sujets*."

In a speech made a little later to the parliamentary members of the Seiyu-Kai—his own political party—Marquis Ito said:

"I go to assume office in Korea with much trepidation, and with a full consciousness of my own incapacity. Nevertheless, though I cannot certainly count on achievement—since in all things failure is more frequent than success—I am resolved to labor to the full extent of my powers.

"From our point of view, we have certainly had in Korea a most painful experience; but, on the other hand, the Koreans, looking at it from their point of view, doubtless think that they too have been subjected to great pressure. They do not submit to us willingly, and, under bad guidance, they might break away altogether from our control. If, therefore, we do not win their sincere allegiance, we may have again all the old troubles. We must make them understand that if Japan subjects them to a protectorate, it is only because she is compelled to do so in order to preserve her own independence. She does not wish to deprive them of their liberties nor to injure them in any way.

"In dealing with the Korean problem, and with the pitiable condition of the Korean people, I shall not confine myself to words, but in matters of finance, as well as in matters of administration, I shall give them practical proofs of my sympathy. In view of their restlessness under our protectorate, I hope that you, gentlemen, will not give them cause of offense, but will try to make them see that we have common interests. Show them, if possible, that we are fellow-passengers in the same boat, and thus remove their feelings of suspicion and hostility. This is not merely my thought; it is what our nation hopes for and what our Sovereign desires. I take office with the firm resolve to carry out his Majesty's purpose, and I therefore pray that you also, gentlemen, will sympathize and will take care that the lives of tens of thousands of our countrymen shall not have been sacrificed in vain."

The last time I saw Marquis Ito before he left Tokyo for Seoul; I said to him that I hoped to return to the Far East in two or three years for the purpose of watching the development of China and seeing how the Korean problem worked out.

"You'll probably be disappointed," he said, "so far as Korea is concerned, because you'll expect too much. I hope to accomplish something—to lay the foundations of order and prosperity—but when a country has been misgoverned for centuries, things can't be set right in a couple of years."

Professor Ladd has recently given us an account of Prince Ito's work in Korea, but it is too soon yet to estimate properly its value and importance. Meanwhile, the distinguished worker has been murdered by one of the people whom he so earnestly tried to help. It is one of the tragic facts of history that ignorant and misguided patriots often kill the very men to whom their country is most indebted and from whom it has most to expect. In assassinating Durham W. Stevens in San Francisco a year and a half ago and in shooting Prince Ito to death in Harbin the other day a few deluded Koreans not only disgraced their country but deprived it of two of its best and truest friends.

PRINCE HIROBUMI ITO

sort of thing doesn't do any good, and, besides, it isn't wholly true. If you want to write something that will be useful and helpful in Japan as well as in America, wait until you have been here long enough to form accurate opinions, and then write about things that are of some consequence. And, above all, don't hesitate to say that things are bad when they seem to you bad, and when you have studied them enough to know why they are bad. If you do this, your work will be useful to us, and perhaps it won't be any the less interesting in America."

I was not a little surprised and taken aback by this frank advice from the Prime Minister, but I thanked him for it sincerely, and said that, although I feared I should make a good many blunders, I would try hard to see things aright, and, at any rate, would never call a bad spade a useful agricultural implement, just out of courtesy. At the same time I said to myself: "People have asked me before to tell them of their faults frankly, but I have never tried it on without getting into trouble. That will probably be the result when I begin to criticise things Japanese; but—we'll see!"

A year and a half elapsed before I had occasion to criticise the Japanese unfavorably or to say anything of them that was not pleasant. I saw in Japan and Manchuria hundreds of things that were either admirable or remarkable, and wrote twenty-six letters to The Outlook about them; but I did not find it necessary to condemn the Japanese or their methods until I prepared a series of three articles on Korea, in the fall of 1905. In the second of these articles I attacked Japan's administration of affairs in the peninsula; pointed out what seemed to me fatal mistakes in her policy; condemned the Nagamori land scheme as apparently an attempt to exploit the defenseless Koreans in the interest of Japanese speculators; gave details of many cases in which unscrupulous Japanese immigrants had treated the natives with cruelty or gross injustice; showed the inadequacy of the Japanese consular courts as a means of affording the Koreans protection or redress; accused the Japanese authorities of weakness or indifference in sanctioning the appointment of Korean Ministers whom they knew to be liars, robbers, and extortioners; criticised unfavorably the virtual confiscation by the Japanese military authorities of large areas of private Korean land; deplored the failure of Japan to protect the people of Korea from the violence and extortion of corrupt Korean officials; and, in general, described as bad everything that seemed to me bad in Japanese management of Korean affairs. In conclusion, I said:

"It is an ungracious and unwelcome task to criticise, in what may seem to be a hostile spirit, the administration and the behavior of the Japanese in Korea; but I am extremely anxious that they should succeed and prosper there, and it seems to me better to deal with the situation honestly and frankly than to pretend that everything is all right when I know that it is not all right."

Although in thus criticising the Japanese I was acting strictly in accordance with Count Katsura's advice, it seemed to me that I ought, in common fairness, to let the Government see the unfavorable report on its Korean administration that I was about to make to the readers of The Outlook in America. The Premier and Baron Komura had both been more than ordinarily courteous to me; I had three times been the guest of the Government on its war-ships or transports, and, in view of such friendliness, I felt in honor bound to play not only a fair but a perfectly open game. I therefore made a typewritten copy of my three Korean articles —about 14,000 words—and sent it to the Japanese Foreign Office at the same time that I mailed the original manuscript to The Outlook. I greatly feared that it would make me a *persona non grata* in Japanese official circles, but it had to go to them, nevertheless.

Day after day passed without bringing any reply to my brief note of transmittal, and I was beginning to feel rather low in my mind when I happened to meet on the street one afternoon a friend from one of the legations who was on very friendly terms with the Japanese and generally knew their views with regard to current events.

"Have you heard what happened to your Korean articles in the Foreign Office?" he inquired.

twenty-two years old, he made his début in the literary world with a volume entitled "Les Musardises." He has since published other works in verse, aside from the dramas in verse above mentioned. It must be admitted that this style did not exactly please either of the two great schools then reigning, the so-called Parnassians or the Symbolists. The first school had been represented by such cold, glittering, and yet worthy men as Leconte de Lisle and Sully-Prudhomme. The younger critics of the Symbolist school were also chary in their appreciation. But both schools have gradually been conquered by the continual output of a fluent and sinuous speech, full of individual, delicate, and bewildering fancy.

Amid all his success M. Rostand has shown a fine sense of personal balance and poise. M. Coquelin says of his appearance on the first night of "Cyrano:" "The *coulisse* and the dressing-rooms were packed by the critics and the author's friends, who were beside themselves with delight. I was trembling so that I could hardly get from one costume into another, and had to refuse my door to every one. Amid all this confusion Rostand alone remained cool and seemed unconscious of his victory. He continued quietly giving last recommendations to the *figurants*, overseeing the setting of the scenes, thanking actors as they came off the stage, with the same self-possessed urbanity which he had shown during the rehearsals, and finally, when the play was over and we had time to turn and look for him, our author had disappeared, having quietly driven off with his wife to his house in the country, from which he never moved for a week."

# Prince Ito and Korea

## By George Kennan

MY personal acquaintance with Prince Ito was largely, if not wholly, the result of an article that I wrote for The Outlook, in the fall of 1905, entitled "The Japanese in Korea," in which, for the first time, I criticised unfavorably the policy of the Japanese in the peninsula and attacked some of their methods.[1] The story of the way in which that article affected my relations with the Japanese Government is partly a personal one, and I did not expect ever to tell it; but since it reveals a very admirable side of the Japanese character and throws light upon the attitude of Prince Ito toward the Korean people when he went to Seoul as Resident-General, there is more reason, perhaps, for telling it now than there ever has been before, as well as more justification for a narrative that I cannot help making personal.

When I arrived in Tokyo, as correspondent of The Outlook, in the spring of 1904, I called upon Count (now Marquis) Katsura, the Japanese Prime Minister, with a letter of introduction from Baron Takahira, the diplomatic representative of Japan in the United States. Count Katsura received me pleasantly, and, after a few courteous inquiries with regard to my voyage across the Pacific, looked again at my letter of introduction, and said:

"Baron Takahira tells me, Mr. Kennan, that it is your intention to write about Japan. Now I hope that when you do, you'll describe things as they are, and especially things that seem to you bad. Most travelers who come here praise us too much and with too little discrimination. Three-fourths of them try to make it appear that Japan is a sort of fairy-land of picturesque scenery, beautiful geisha girls, fascinating tea-houses, wonderful flowers, men who are never discourteous, women who are never immodest, and babies that never cry. Now that

[1] The Outlook, November 11, 1905.

tinue indefinitely — some have declared at least a month — are in reality shorter than the average European comedy. The continuity of performance is due to the fact that plays follow one another in quick succession without noticeable intermission. Acting is a continuous performance, and though the bill changes, the actors with remarkable endurance do not. One thing the Chinese theater has brought to us in all its perfection is the art of pantomime, so subtly developed that speech is almost unnecessary, and the action alone wholly reveals the thread of the plot and the emotions of the actors.

And so they build, each embodying the traditions of his race in the new edifice. And, one day when all is finished, and the harmonious medium of one tongue has selected and assimilated the best out of the traditions of the whole, there will arise a new American playwright, one who understands all, who will take his place in the chancel of the nations, and cry out his message to all the world, and for all the world.

A STRIKING CONTRAST BETWEEN THE OLD AND THE NEW
The aqueduct near Queretaro, built in 1729, and a modern train

# THE PROGRESSIVE MEXICO OF TO-DAY

BY

NEVIN O. WINTER

AUTHOR OF "MEXICO AND HER PEOPLE OF TO-DAY"

MEXICO is a country of great national resources and possibilities, which have only been partially developed. Its soil is remarkably fertile and could support five times, and, if water could be found on the plateaus in sufficient quantities, ten times the present population. And I say this notwithstanding the fact that one writer has said that Mexico is the poorest country south of Greenland and north of the south pole. The flora of the country, among which are many useful and medicinal plants, is exceedingly rich and varied. More species of fiber plants are found there than in any other country, and the commercial value of these plants is not yet fully understood or appreciated.

It is as a mining country that Mexico has been best known. The Mexican silver mines have been famous ever since the dis-

KAROL H WACHTEL
Stage director and leading man, the Polish Theater, Chicago

CHRIS BRUNELL
Director of the Swedish Theater of the Northwest

A. SZWAJKART
Promoter of the Polish Theater of America and an actor of character parts

ELLIS GLICKMAN
Actor and Impresario, the Yiddish Theater

their own number. Frederico Amato has constructed some half-dozen worthy pieces in the realistic manner, dealing in one instance with a sad paternal note on the wide breach between parents and children created by American customs. It is the tragic cry of the foreigner who stands still and defies the new institutions to change him.

The Greeks of Chicago have found a patroness and friend in Jane Addams, the sociologist. She has encouraged the formation of the Association Versoniton, a dramatic organization, and has allowed them the use of the Hull House Theater for public performances. The association commendably strives to stir up an American interest in both classic and modern pieces that are Greek, indeed, to the average. It is a drama commanding in its chaste form, from the "Ajax" of Sophocles to the modern revue of some expatriated Hellenic journalist. Even the fruit vender knows the "Cyclops" of Euripides; he knows the "Galatea," the patriotic "Ypsilantis," the "Gulpho," and he weeps honest tears of mingled sorrow and pride over the beautiful accents of his own classic tongue in all its world-impelling grandeur.

Some one has said that the most uncompromising new American is the Chinaman. Unamenable he may be, but he has at least been influenced by the American theater to the extent of introducing scenery and a drop curtain in his own. What would Chinatown be without the fanfare of a string band, shrieking discordant Chinese music, reminding the coolie—and others—that the play proceeds? It is a feverish, wonderful little place—that theater, where tragedies a thousand years old are continuously enacted, where the native learns the rare traditions and history of all the dynasties of his native land. A code of lofty morality is taught in social drama. Somehow it is a maligned and misunderstood theater. Its plays, which appear to con-

covery of the New World, and they are still a great source of wealth. Although for a thousand miles the republics of Mexico and the United States have the same border line, the average American knows less concerning the real, present-day Mexico than he does of most European countries; and it is much misunderstood, as well as misrepresented. Great progress and advancement is being made there, of which Americans should be informed and they should keep in constant touch with the Mexican progressive movement.

Mexico is not without her faults, but the greatest of these are the result of conditions for which the present generation of nation-builders is not responsible. A land that is hindered by a racial conservatism and obstructed at every turn by tradition does not become entirely modern in a decade or even a generation. And yet, the actual accomplishments of the past twenty years are marvelous. Americans who have dwelt there during that time are enthusiastic in describing this great change for the better. Whereas formerly people hesitated to invest money for fear of political complications, now Mexican securities have a fixed value and foreign capital is pouring into the country at the rate of from one to two hundred millions of dollars each year.

The reason for this great influx of capital is that the people are simply installing in a hurry the things that other countries have been acquiring for the half of a century and more. Every city is bestirring herself, and electric-light plants, modern sewerage systems, water-works and ice-plants are being constructed as rapidly as things can move in this land of procrastination. Old, crude methods of power are being replaced by modern up-to-date machinery in mines and manufactures. The merry hum of the trolley is fast succeeding the bray of the long-eared motors formerly in use, and the brown back of the human cargo-bearer is being relieved of its burden by the railroads, which are rapidly spreading over the country.

Mexico lagged behind so long that she had quite a distance to go, and it will be a long time before she will entirely catch up. The wants of the great mass of the people are so few that many years must elapse before there will be a great change in their method of living; but their children are being educated and that in itself will work wonders in their uplifting. As national wealth increases, better wages are being paid and the surplus earnings are expended for more and better goods. It is said that wheat bread is even replacing the beloved tortillas, or corn-cakes, of the natives, so that Mexico may eventually take to eating prepared breakfast foods. Add to this, the wearing of American shoes, and teach them to sleep on beds instead of mats, and their civilization will be complete.

Nowhere has greater change taken place than in the City of Mexico. It is under the control of the progressive national government and immense sums of money are being expended in civil improvements and public buildings. Plans have been drawn for fifty million dollars' worth of public buildings, many of which are already under way. The fine new postoffice, which was opened a few months ago, is a beautiful structure and would be an ornament to any city. It is equipped with every convenience and is finished within and without in elaborate style. The new National Theater, which is being erected to cater to the amusement lovers, is now only a mass of steel, but is designed to be the finest theater in the new world and will cost an immense sum. A new legislative palace is under construction, which is the most pretentious building yet planned and will cost $10,000,000, so it is estimated. An entire block is being razed to make room for the new Panteon Nacional, a resting place for Mexico's illustrious dead. An army and navy building, a museum of art and a department of public works are among the other improvements planned for the ancient Aztec capital. The buildings are being scattered over the city, instead of following the group plan as designed at Washington. The government plans to have these buildings all completed by 1910, which will be the first centennial anniversary of the declaration of Mexican independence by the patriotic priest, Hidalgo, and his followers. In many respects this city is fast becoming cosmopolitan.

Perhaps nothing has contributed so much to the progress of the last quarter of a century as the increase in railroad construction. The centers of population in Mexico have always been situated in

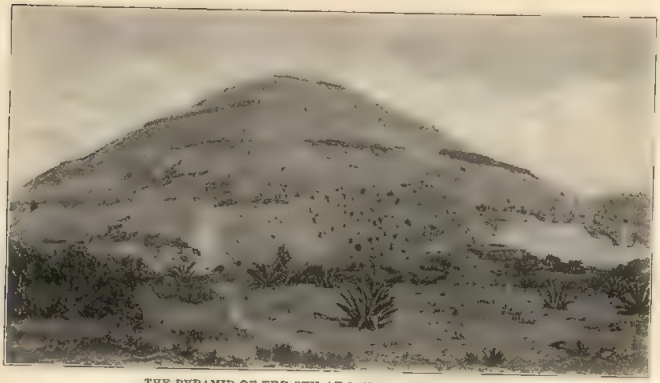
the interior away from communication by water, and accessible only over narrow and rough trails. This kept each community isolated and aloof from modern progress. The people had no ambition for anything better or more advanced than their fathers had enjoyed, because few of them traveled or saw anything different. It also prevented the development of a genuine national spirit. Whereas formerly Mexico was noted primarily for her mineral wealth, the increase in commerce and manufacture and the stimulus to agriculture, brought by railroads, has swelled the general wealth of the country more than mining ever did. Manufacturing plants have sprung up on every hand, and the products of the mills are increasing each year. These factories include almost every line of trade, from the making of goods to adorn the outward man to the solid and liquid goods which cheer and sustain the inward man.

The contact with other civilizations has also increased the wants of the people in a large degree. Guadalajara is the second city in the republic and is fast becoming a manufacturing center. A thousand substantial buildings are going up and labor is at a premium. Puebla is noted for its cotton goods, paper, flour, soaps, onyx and marble. San Luis Potosi is growing rapidly and has a large American colony. Monterey is more Americanized than any other city, and is marching ahead with rapid strides. The same story of progress might be told of a dozen other cities of this progressive land.

Encouragement to railroads has been given with a lavish but well-directed hand. The lines of iron rails are still reaching out under governmental supervision and subsidy and binding the country together even more closely. The Mexican Central has almost completed its branch to Manzanillo, which will give the capital a short and direct route to the Pacific. The Southern Pacific is threading its way south toward Guadalajara. The National is constructing a direct connecting link from the capital to the important port of Tampico. The Kansas City, Mexican & Orient is heading for the west coast, and the Pan-American Railway is rapidly nearing the boundaries of Guatemala. The Tehuantepec National Railway, in its first year, probably transported as many goods between the Atlantic and the Pacific as the Panama Railroad, and is a dangerous competitor of that route, because of the lessened distance between New York and western ports. The great port works at Salina Cruz are nearing completion and millions have been or are being spent in other harbor improvements.

The development of the water-power in the country is now commanding a great deal of attention. The greatest undertaking as yet has been the harnessing of the Necaxa Falls and as a colossal hydro-electric proposition it is of great interest. It is probably the largest single investment, outside of railroad construction, that has been made by foreign capital. A Canadian syndicate has invested about $30,000,000 in this proposition and its allied interests, which will develop enough power to turn every wheel in the Valley of Mexico, Puebla and several other cities. As these falls shrivel in the dry season to an unimportant brooklet, the great valleys have been walled up with immense dams to store water sufficient to tide over this season. The plant complete will furnish two hundred thousand horse-power of energy and will provide a cheap and unlimited power for this land, where fuel is so scarce and expensive. Numerous other waterfalls are awaiting similar development, which would mean much for Mexico and would no doubt provide a good profit for investors.

The mining industry has not been neglected. This country, which furnished the wealth that enabled Spain to build up her great empire, and built many a real castle in Spain in the olden days, is still producing immense sums of silver and other metals. The annual production of silver amounts to about $35,000,000 in gold values, thus giving that country first place, and it occupies fifth place in the production of gold. The output of copper is increasing very fast. The Spanish bonanza kings worked only the very richest of the mines — those yielding less than a hundred ounces to the ton were not touched by them. Many mines were abandoned because they could not keep them free from water, as only the most primitive methods were in use. Now, modern pumps are replacing the mule and windlass, as well as the bucket brigade, formerly used exclusively. Improved meth-



THE PYRAMID OF THE SUN AT SAN JUAN TEOTIHUACON

The restoration of this pyramid was started in 1905 and is now nearly completed. The pyramid measures 750 feet at the base and 215 feet high, or more than half the size of the great Cheops of Egypt

ods of separating the precious metals from the quartz have taken the place of the old "patio" process. Smelters and mills for the cyanide process are springing up on every hand, and mining conditions are probably better than ever before. This, however, does not mean that every Mexican mining proposition should be looked upon with favor, for the fame of the old "bonanzas" still aids fake companies and unscrupulous promoters in fleecing the gullible.

The tropics of Mexico are among the most productive parts of the world. Instead of being given up to impenetrable jungles, the homes of reptiles and breeding places of poisonous insects, they should be made to produce those luxuries and necessaries which contribute to make civilized life tolerable. As yet Mexico supplies but a small portion of tropical products to the United States, yet the possibilities of agriculture are equal to those of any similar lands. It will not be many years until the agricultural products will exceed the mineral products a hundredfold.

Coffee and banana culture go hand in hand, for the broad leaves of the banana provide the shade so necessary to the young coffee trees and, at the same time, provide a little revenue while the more valuable plant is maturing. The coffee region in Mexico is very extensive and the quality produced is equal to the best. Great fortunes have been made out of both of these products in other countries and could be here. The production of sugar is rapidly increasing, as it is said that the cane has an unusually large percentage of saccharine and does not need replanting near so frequently as in our own cane-fields. Cacao, another typical tropical product, oranges and cocoanuts, are among other tropical fruits whose cultivation will be greatly developed in the future. Then, rubber and a hundred and one useful and medicinal plants offer a good field for development. What the tropics need is men of energy backed up by capital sufficient to utilize large tracts of this rich soil.

Every statement of exports to and imports from the United States shows an increase of many millions. The increase of imports in the last year for which statistics are available was 23.83 per cent, and of exports, 30.03 per cent. Of the imports more than half came from the United States, and of its exports about seventy-one per cent came to us. This is sufficient to show Americans that the markets of Mexico are worth cultivating while the trend is our own way, and that we

should fully appreciate the great development and awakening that is now taking place right at our very doors. No other country, Cuba alone excepted, sends so large a proportion of its exports to the United States.

The statistics of the exports and imports of Mexico should make interesting reading to a patriotic American. The total exports for the year 1906-7 amounted to $124,000,000 and the imports for the same period were $117,000,000, the latter being an increase of nearly $7,000,000, although the exports showed a slight decrease. The great lead of the United States in the value of goods sent to Mexico is shown in the following figures for the three leading exporting countries: United States, $73,000,000; Germany, $12,200,000; Great Britain, $11,800,000. Of the imports from the United States many millions of dollars were for machinery and railway supplies. We imported from Mexico nearly twenty-five million pounds of coffee, $2,000,000 worth of tobacco, and $4,000,000 of vanilla.

Mexico is making strenuous efforts to develop the arid plateaus by means of irrigation and through the development of what is termed dry farming. Then, too, it is endeavoring to break up the great estates into smaller holdings in order to encourage agriculture. At present about seven thousand families own almost the entire landed surface. There is one farm in the State of Chihuahua of seventeen million acres. The traveler might journey for days and cross ranges of mountains and not pass beyond the princely domain of this one man. Another man owns five million, another two million and an irrepressible American owns a paltry million acres.

Eighty years ago ninety-five per cent of the population of Mexico were in profound ignorance. Fifty years later the conditions were not much better. It might be said that the educational system has been created within the last quarter of a century. Now there are few communities of any size which do not have educational facilities, although there is a large proportion of the population who do not yet attend them.

New and modern school buildings are being erected in all the cities, but education is slower in reaching the outlying villages. The idea of a school building without a playground is new to an American, but old church properties are generally utilized and they have a gloomy and monastic appearance. In the capital city, millions are now being spent in new buildings and modern equipment, and it will not be many years before the benefit will be appreciable. Mexican statistics show that school privileges vary from one school for each 687 inhabitants in the State of Morelas to one for each 4,596 inhabitants in the State of Guanajuato. The English language is a compulsory study in certain grades, so that one can look into the future to a time when there may be two idioms in Mexico. Schools are even maintained in the soldiers' barracks and in prisons. By this means a good citizen is made out of many a convict, and a better one out of many a soldier who has served his enlistment.

One writer has well said that "Mexico has just begun to scratch around the margin of her opportunities." The establishment of the gold standard in 1905 did more than anything else to place firmly the government finances on a secure footing, although for ten years there has been a comfortable surplus each year. The surplus last year was nearly $15,000,000, which is more than the entire government receipts in 1886; certainly a good indication of healthy growth. During that time the government has come into control, by actual purchase, of seven thousand miles of the eleven thousand miles of railway track in the republic, and is succeeding very well in its management of those properties.

The republic of Mexico has passed through dark days, but has come forth into the light. It has suffered from the evil government of foreigners and from the reckless ambitions of its own rulers. Through these trials it has emerged wiser, because of the lessons of adversity. American intelligence and capital, of which at least one billion of dollars has been invested there, have done much toward bringing about the present prosperous conditions and will do much more in the future. To President Diaz, however, due credit must be given; and to him, more than all other influences, is due the present marvelous progress of our neighbor across the Rio Grande.

# CHANGING CONDITIONS IN THE CARIBBEAN

BY

ROBERT A. WILSON

CUBA, San Domingo and Porto Rico, with the lesser Antilles, form the outer rim of the Caribbean. On the south, its waters wash the shores of Venezuela, Colombia and Panama. Excluding Salvador, Central America forms the western rim.

Until comparatively a recent date Latin-American sentiment could not have been truthfully described as friendly to the United States. Prior to the war with Spain, it was in many sections of South and Central America distinctly hostile. Every move of their big neighbor on the north was viewed, if not with apprehension, at least with suspicion. This was not unnatural. Spain had once ruled in these parts, and her rule had ever been with the sword. The policy of Spain was one of territorial aggrandizement. It was difficult to realize that the increasing interest of the United States in Latin-American countries was due to any other motive.

The unselfish assistance rendered Cuba in her struggle for independence, the very generous terms imposed by the United States upon her conquered foe, and the manner in which the little Cuban republic has been placed upon her feet, politically and industrially, created a profound impression throughout Latin-America. And since then many things have happened in these tropical waters to change an impression derived mainly from lack of knowledge of each other.

Ten years ago the trade of South America was almost wholly with Europe, and that of Central America and the Caribbean Islands was very largely with England, Germany and France. The United States has made but little effort to secure this trade, and, such as it was, it was about confined to necessities. To bring about closer relations, a better knowledge of the two sections of the continent was essential, and the International Bureau of American Republics started at Washington, with its work mapped out. So far-reaching has its work now become under the practical management of its present chief, Mr. John Barrett, that it is not too much to say that the main factor in the campaign of education which has resulted in so complete a change in Latin-American sentiment has been this Bureau, and it has taught North Americans that their next-door neighbors are a mighty fine race of people when you get to know them.

It is now accepted in all these countries that the policy of the United States in dealing with the Latin-American republics, is to assist by kindly offices in their industrial and economic upbuilding, and the furtherance of the principle of arbitration. Individual sentiment has become friendly, and closer social and commercial relations are desired everywhere. Even the serious misunderstanding with Venezuela, which has led to a severance of diplomatic relations, has more to do with governments than the people. The action of President Castro does not reflect a hostility among the Venezuelans to the people of the United States. It is but a temporary condition that will eventually lead to a better understanding.

### What the United States Has Accomplished in the Caribbean

A decade ago the flag of Spain floated from the walls of Moro Castle and the battlements of San Juan; to-day Cuba is an independent republic, with close treaty relations with the United States, and Porto Rico American soil. A decade ago the Republic of Panama was unborn, the

Centralia Sept 16 1858

Hon: M. P Sweet

My dear Sir

Yesterday Douglas was met at Jonesboro. A very trifling thing occurred there, [illegible] a little uneasiness. I was, at the suggestion of friends, putting me, some resolutions upon the subject of abolition &c, passed by Douglas friends, some time ago, as a test to try this attempt of a false character against me. Among other I put the question to J. Campbell your Governor to them, in 1850 when you were he was for Congress. As my slender pile was arranged, Judge Logan upon that one, your Judge was pending to the present one, I mentioned your name, as Campbell opponent, for a case former pendency, which, when I heard it by accident struck me as having something unfair in reference to you in the. I instantly corrected it & so advised the reporter to suppress it; but my fear now is that those present are reporter Douglas, has with him will try to make something out of it. I am not [illegible] greatly concerned what it was, so letter Governor hear it with any particular interest or any way, even I purely hope no one may be hearer of it. But of this please, I write this to assure you that nothing can be further from me than to [illegible] unfriendly [illegible] anything disrespectful to you.

I sincerely hope you may hear nothing of it except what I have written.

Yours truly.

A. Lincoln

FACSIMILE OF A LETTER FROM ABRAHAM LINCOLN

This letter was written fifty years ago to Martin P. Sweet of Freeport, Ill., for the purpose of forestalling any misinterpretation of an expression in Lincoln's speech

IN THE HEART OF THE COFFEE COUNTRY, AT SAN PEDRO, HONDURAS

Valuable lands in Honduras traversed by rivers and mountain streams are awaiting cultivation and the construction of transportation lines

canal but the figment of a dream; to-day the little republic has a population of three hundred and sixty thousand, and the canal is fast becoming a most valuable asset. A decade ago Central America was riven asunder by internal dissensions; to-day, the ink hardly dry upon the most advanced treaty of modern times, proclaimed with the backing of the United States and Mexico, the curtain rises upon what promises to be the greatest industrial development of the century. And little San Domingo, yesterday bankrupt, with an external debt greater than the assessed value of her lands, to-day, through the kindly offices of the United States, looms up with an apparent foreign credit of upwards of a million dollars. And even little Hayti is now to be financed and cured of her ills, and taught to walk as the well-to-do walk, head erect, and without help.

The bulk of the North American investment during the last ten years went into Cuba and Porto Rico. At the end of 1906 American capital invested in Cuba is unofficially given at $141,000,000. You can safely add $50,000,000 to that figure. At the close of 1908 you can add $25,000,000 more. Ten years ago the value of trade between Cuba and the United States was $24,794,133. In 1907 it amounted to $144,973,116. Ten years ago the value of trade between Porto Rico and the United States was $4,169,912. In 1907 it amounted to approximately $48,000,000. For this period Cuba showed an increase in her trade with the United States of four hundred per cent in her exports and five hundred per cent in her imports, and Porto Rico an increase of one thousand per cent in her exports and one thousand one hundred per cent in her imports.

A VILLAGE ON THE INTER-OCEANIC RAILWAY OF HONDURAS

On August 1, 1908, the Valentine syndicate of New York City acquired this railroad and expect to complete it within two years

During this period there has been but little North American money invested in Central America. In actual money, the five Republics could not show an aggregate amount of $15,000,000. The expansion of Central America's trade with the United States has been in lesser volume than that of the countries above named. The increase has been due to a slight improvement in industrial conditions, better transportation facilities and a decided change in public sentiment. Ten years ago the value of trade between Central America and the United States was $16,500,000. In 1907 it exceeded $55,500,000. And this means that four million people, in a country old in years but with less than seven per cent of its lands under cultivation, are turning to modern methods of agriculture, and within a decade have shown an increase of $39,000,000 in their trade. What will this marvelously rich section of the American continent not be able to show when North America investors awaken to their opportunity and invest even a small per cent of their savings bank deposits here?

**Influence of European Investments**

The investment of European capital in the outer rim of the Caribbean has been large during the last ten years. At the close of 1906 British capital in Cuba was placed at $100,000,000, of which ninety per cent was in railroads. With the exception of two small Guatemalan loans, the entire external debts of the five Central American states are owned by English capitalists. The debt excepted as above is divided up between a German and an American syndicate. The Caribbean trade is carried in European bottoms. The banana importations into England now total over one-third of the Caribbean production. This fruit is about to invade the Continent. The domestic trade of Central America is largely in the hands of resident English, German, French and Italian merchants. The European population exceeds the North American. There is more English money invested in any one of the five Central American states than there is of American in the whole five combined.

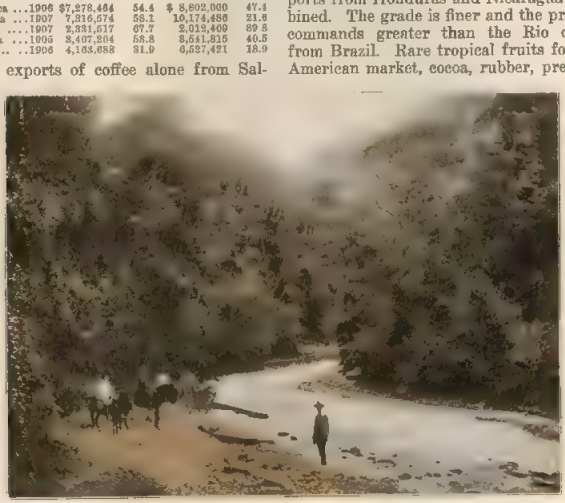
The total trade of the Central Ameri-

can states for the last year for which the figures have been made known, and the ratio of trade values with the United States, is as follows:

| | | Imports. | U. S., per cent. | Exports. | U. S., per cent. |
|---|---|---|---|---|---|
| Costa Rica | 1906 | $7,278,464 | 54.4 | $ 8,802,000 | 47.4 |
| Guatemala | 1907 | 7,316,574 | 58.1 | 10,174,486 | 21.6 |
| Honduras | 1907 | 2,331,617 | 67.7 | 2,012,409 | 89.8 |
| Nicaragua | 1905 | 3,407,204 | 58.3 | 3,541,825 | 40.5 |
| Salvador | 1906 | 4,163,688 | 31.9 | 6,527,421 | 18.9 |

The exports of coffee alone from Salvador in 1906 were $5,900,000. While the bulk of trade from Honduras is less than that from the other Central American states, her ratio of trade is larger than that of any other country on the globe, not excepting Cuba, whose ratio of exports to the United States in 1907 was 87.2 per cent, but whose ratio of imports was but 49.1 per cent. The coffee of Salvador goes to Germany at present.

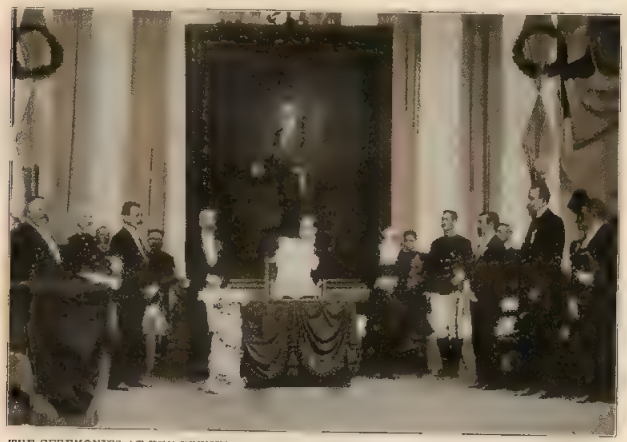
Industrial conditions in Central America, still in their infancy, have, however, reached a point where foreign trade must expand through natural causes. Her lands are beginning to yield their golden harvests, and from now on, for many years to come, her exports will be on an ascending scale. In 1907 the value of her exports of bananas to the United States was $5,660,813 as against $2,083,834 in 1899. In addition there was exported of this fruit to England for 1907 approximately $3,000,000 in value. The exports of coffee from Salvador, commencing with 1906, now exceed the total value of exports from Honduras and Nicaragua combined. The grade is finer and the price it commands greater than the Rio coffee from Brazil. Rare tropical fruits for the American market, cocoa, rubber, precious hardwoods, copper, gold and silver ores are figuring in the export list. The rich bottom lands on the Caribbean, capable of producing the costliest of crops, are hardly opened. In Honduras alone these valuable lands lie behind four hundred miles of seacoast, extending back in some places to a distance of one hundred and fifty miles, traversed by rivers and mountain streams, and fully ninety per cent are uncultivated, mostly unsurveyed, much untrod by human foot. They await the construction of transportation lines.



IN THE VALLEY OF THE SULA, HONDURAS

#### The Railroads of the Western Rim

With the opening of the Northern Road of Guatemala in January, 1908, two hundred and seventy-five miles in length from Puerto Barrios on the Caribbean to San José on the Pacific, the third transconti-



THE CEREMONIES AT THE OPENING OF THE TRANS-CONTINENTAL RAILWAY OF GUATEMALA

President Cabrera of Guatemala is reading the address

nental railroad in the center section of the continent began operations, the other two being the Panama Road and the Tehuantepec Road. The effect is already shown in the increased tonnage from interior and Pacific coast points to New Orleans. A branch of this road from Zacapa to Santa Ana is being rapidly constructed. It will tap the coffee fields of Salvador and have the effect of almost entirely diverting to New Orleans the present exports of coffee to Germany. The saving in the haul is tremendous, and within a few months the last named port will necessarily be the leading coffee distribution port of North America. Railroad building is well under way in Guatemala, not less than five lines, in addition to the Northern, being in course of construction and partial operation.

The next of the inter-oceanic railway systems to be completed will be in Costa Rica, which, owing to the investment of North American capital, is the more industrially advanced of the Central American group. This road will very shortly be in operation from Port Limon to Tivivez on the Pacific.

The fifth of the transcontinental roads will be the Inter-Oceanic of Honduras. Fifty-six miles have been in operation from Puerto Cortez under national control for some years. On August 1, 1908, this road passed to the Valentine syndicate of New York city, and there is reason to believe that active work on the extension, some one hundred and seventy-six miles long, will shortly begin, and the road be completed within two years. When finished, this road will be unique in some respects, its safeguarding being guaranteed by the United States Government under the Treaty of Comayagua.

Between March 1 and July 1, 1908, not less than four concessions were granted to Americans for the construction of railroads by the Honduranian Government, including one to a Chicago syndicate to run from Trujillo on the Atlantic side to Tegucigalpa, tapping the rich mining fields of the Olancho; one from Tela to the Comayagua River through the river bottom lands; and one from Omoa through the pine and turpentine forests of the Chemilicon.

In Nicaragua and Salvador railroad building is active, the latter country having just completed financial arrange-

ments for quite an ambitious railway system outside of the Pan-American link.

The Pan-American Railroad on the north is now close to the Guatemala frontier, and twenty-six miles only of the Guatemala section remain uncompleted. The contractors are confident that this work will be finished by December 31, 1908, when all-rail connection between New York and Guatemala City, a distance approximating 3,900 miles, will have been established. The Guatemala link has a length of 169 miles, and only a few miles will then remain to reach the Salvador frontier. The distance across Salvador is 230 miles, several portions of which have been built. In February Salvador placed a loan of $5,000,000 in London, which is believed to be ample to construct the uncompleted portion of her link. The Honduras link calls for seventy-one miles. Nicaragua has a distance of 209 miles, some already built, some under construction. Costa Rica's total length as surveyed is 360 miles, and most of it is virgin ground. There is reason to believe that her share of the work will be taken up promptly and rushed to completion. The total length of the road through Central America, as contemplated, is about 1,039 miles. Its early completion to Bocas del Toro in Panama is now altogether probable.

### A New Era in Central America

The Central American Peace Treaty was executed at Washington, December 20, 1907. It adopts the principle of international arbitration, and is in many respects the most advanced treaty ever made between a group of nations. While safeguarding to a marked degree the autonomous relations of the five republics, it imposes reciprocal obligations which necessarily lead to a close companionship. Honduras is made neutral ground; a bureau of the Central American republics is to be located in Guatemala, which is to be closely allied to the International

THE TRANS-CONTINENTAL RAILWAY OF GUATEMALA

Opened for inter-oceanic traffic in January, 1908

Bureau of American Republics at Washington, and at each capital is to be a university, devoted to a special line of training and open to the youth of all the republics.

Thus is outlined a system of reciprocal education, which, the dissensions and feuds of the past forgotten in the formation of new friendships and the creation of mutual interests, can have but one result—the eventual formation of the United States of Central America.

Now, it is not claimed that this can all be done in a moment. Ideal conditions exist nowhere on earth. It will take a little time to learn to forget, and there may be bickerings and jealousies, and an attempt perhaps on the part of the minority at times to resort to the old codes. But it will not be permitted. The industrial era, of which railroad construction work is invariably the forerunner, has set in, and it has come to stay. And it requires no exceptionally keen eye to see that the happenings around us are all making to that end. Without a seer we can foresee that the white walls of the Temple of Peace, whose construction has been made possible by this treaty, will some day shine afar to the mariner on two oceans, symbolizing the union of a brave, generous and devoted people.

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# THE NATION'S HEEL OF ACHILLES

BY

GEORGE AGNEW CHAMBERLAIN

AMERICAN CONSUL AT PERNAMBUCO, BRAZIL

*"No merchant ship of any description flying the American flag entered the port during the year."—Annual Report on Commerce and Industries for 1907, Consular District of Pernambuco.*

ONLY sixty years ago there was an ocean highway blazed by the American flag that swept on the grand circle from New Bedford almost to the African coast, bending back from Sierra Leone to cut into the South Equatorial current just below St. Roque on the American side.

It was the Yankee skipper, then master of the seas, and a fleet of seven hundred whalers, to say nothing of the fastest clippers that ever spread sail to the trades, that laid out this famous course, and by avoiding the doldrums, the Sargasso Sea and the up-coast currents of the North Brazils, proved that the longest way 'round was the shortest way through to the whaling grounds, the trading-ports of the Spanish colonies and the South Brazils.

Tucked under Cape St. Roque and just at the start of the free run, with wind and current helping down the east coast, lay the port of Pernambuco, famous in the annals of the Dutch and the Portuguese and favored by Nature with one of the safest and oddest harbors on earth.

It lies to-day as it lay then, a level shore backed by the high five-story houses that have outlived by a century the pioneer merchants who built them. They face a strip of water three hundred feet wide and a mile long, cut off from the open sea by a granite reef just topping the spring tides and so straight and level that you would say the Dutch had built it to carry the stubby lighthouse and little octagonal fort they placed at the entrance to the narrow port.

Beyond the reef, with its crashing billows and high-flung spray, was the roadstead where the whalers and other ships of passage cast anchor and rode the seas, leaving the inner haven to the cargo and packet boats and those who came in distress.

Besides being the first landfall after a forty days' run, Pernambuco was at a meeting of the ways, for never a ship

# IGNACIO ZULOAGA: SPANISH PAINTER

BY

JAMES WILLIAM PATTISON

AUTHOR OF "PAINTERS SINCE LEONARDO" AND LECTURER ON THE COLLECTIONS OF THE ART INSTITUTE OF CHICAGO

*Illustrations copyrighted by the Hispanic Society of America*

NO art can be immediately popular unless its meaning be obvious and easily understandable. The serious minority studies patiently, finding pleasure in the gradual development of pleasurable sensations rather than in an instantaneous flash of delight. The generality of people demand a measure of amusement at the theater, the musical performance, in the book of poetry or at the picture gallery, and are not willing to wait for slowly awakened enthusiasm. The student's pleasure lasts longer and satisfies a deeper sensibility. It may not be unsafe to declare that no art can be great that is obvious.

Many hundreds of intellectual people are asking the question: "Which is the greater of the Spanish painters whose works have excited the enthusiasm of Paris, London, New York and other cities: the painters Sorolla and Zuloaga?" It is plain that the attendance at the Sorolla exhibitions has been larger than at those set apart for Zuloaga, and the purchases have been far more numerous. Still, it is very unsafe to declare that any contemporaneous artist is greater than Sorolla, so wonderful is he. The meaning of his painting has been declared to be "obvious" and, therefore, popular. But its deeper significance is not obvious. The average gallery visitor sees its story instantly, is delighted by the vivid representation of his own joyful experiences in the sea bath and by the glorious impression of sunshine, is carried off his feet by its brilliant color and galloping brushwork, but these do not measure the greatness of the art by any means. The student discovers numberless evidences of masterfulness beyond these trappings of the parade. Sorolla is very deep.

Possibly Zuloaga is still deeper. Many artists have declared that he is so. Certainly, his pictures grow in greatness from moment to moment of the hours spent in careful study, and the reward to the student is thereby the richer, because of his gradual development of feeling. It would be useless to denominate Zuloaga's painting as popular; the subject matter is vaguely repulsive to many, and the story he tells reminds us of nothing in our own lives either pleasant or interesting. Probably Michael Angelo's "Last Judgment" or Dante's "Inferno" are also vaguely repulsive to the majority, nor do they remind any one of summer sunshine or the last gay picnic in the country. Zuloaga's mastery of color is astonishing to the trained artist who measures things by the yardstick of experience, but it is too unusual for the hasty visitor's capabilities for orienting himself. I suspect that it is safe to declare that great art never wears its heart on its sleeve.

Zuloaga was born in the rugged mountain country on the northern sea coast of Spain, where the north winds blow in the elements of pugnacity, energy and uncompromising independence, and the surf of the tempestuous Bay of Biscay hammers out individuality of character. The inhabitants of the Basque provinces, where Zuloaga was born, remind us of the tenacious and honest Swiss or the hard-headed Scotch Presbyterians. These Basques are a race apart, and no man knoweth the source of them or exactly what race they may be. Their common people can not speak Spanish, and the educated will not unless obliged to. They are Spanish and not Spanish, showing the individualities of two races vigorously, as

all that they are and do is done unstintingly. Zuloaga has developed these characteristics in the most marked manner, which explains many things needing explanation, which is the key unlocking the secrets of his artistic character.

Sorolla is of the gay and sunny South; he is himself only in sunshiny weather, clouded by every passing cloud, considering disease and death as subjects unfit for conversation, wondering that his contemporary, Zuloaga, on the contrary, can paint such weird creatures or dwell upon the unspeakable disagreeableness of the exceptionable characters found in provinces beyond the circuit of modern sleeping cars. The quaintness and spiciness of these lost provinces of Spain have no charms for Sorolla. He is loth to acknowledge that such people exist in his beloved Spain. Indeed, it is true that the majority of Spanish people do not relish this art or the unadulterated truth which it teaches.

The important work which Zuloaga submitted to the Art Commission which selected pictures for the Spanish section of the Universal Exposition in Paris (1900) was rejected on a frivolous pretext, though Sorolla was finely represented. It was the making of Zuloaga, this incident, because all Paris flocked to see his picture, exhibited in a private gallery, regarding which many artists were enthusiastic, and it was at once purchased by the Museum of Brussels. The Luxembourg purchased a picture immediately and, before two years had expired, the museums of Dresden, Vienna, Berlin, Frankfort, Bremen, Venice and Munich were each graced by an example. Even Barcelona was induced to save the situation in Spain. But this did not serve to mollify the artist for repeated slights in his native country. He did not love Spain the more because of them, and remained in Paris where his success was. Frequent visits to the cities of his native country kept him in touch with the characters he loved to portray. He became a familiar figure in the dance-houses of the common people, securing the love of the wild sons and daughters of joy who led the dance, and these became his models.

At the time of one of the recent visits, a movement was undertaken to give the artist a public greeting in acknowledgment of the reputation gained in foreign lands. But Zuloaga felt that this would be undesirable, in view of the general disapproval of his paintings by the people at large. The people did not like his statements of character of vagrants in their goodness and badness, the verity of his characterization of bull-fighters and peasants in their mannerisms of costume and movement, the essence of their actual vitality. These were not paintings of mere manikins posing at so much the hour, but showings of the inwardness of actual, unadorned, unidealized people of the class not tainted by the glossings of artificialities. The people of Spain loved better the artificialities which the world supposed to be universal with them, and were offended. He sought out unheard-of creatures and felt their feelings, entered into the spirit of their lives. He lived in the homes of these folk, eating and drinking with them, assisted at their marriages, their baptisms and funerals, felt the shining animalism of their eyes, noted the glint of their teeth, their brown-redness of skin and coal-black hair. It is the fashion with them to chalk their faces, and thus we see warm skin about the eye-sockets and under the chins, while the major part of the face is strangely purplish and uncanny.

The Spanish people seem to have forgotten that one of the most noted paintings by Ribera is of a deformed boy, that Velasquez studied strange characters and Murillo delighted in the rendering of many cripples and diseased persons. It is almost a Spanish trait, this wonderful ability to present the inner character of peculiar individuals. Zuloaga painted for the pleasure of noting all these strange facts, nor thought for a moment of the commercial side of his profession. He visited unknown places, penetrating the mountains with muleteers, making friends with vintners and peddlers, falling ill in the house of a sorceress in a province where the manners of the early eighteenth century still maintained themselves, and where it was sixteen hours to the nearest doctor and eight hours to the neighboring druggist. In a village close to the borders of Portugal he found a people who spoke no Spanish, the descendants of a company of Trappist monks who had long since become more bandits than priests and who

"THE SORCERESSES OF SAN MILLAN"

This is a play in some decidedly strange tones of green contrasted with small parts in full red and a ground of neutral violet

did not know what to make of a visit from a police officer who strayed that way. Thus he caught these creatures at liberty, comically serious, or laughing in a disquieting fashion. His painting dispels many illusions, but what enchantment in it all!

In "The Dwarf Gregorio" he places the home of these strange creatures as a background. One of the men is made to look excessively tall by the unbroken length of his gray shawl, and his hat at the picture's top, contrasted with a dwarf in two colors, which make him shorter. Their home is a dried-up city on a hill of greenless gray, a fit locality for the breeding of such monsters, uncouth but probably strangely witty. This is one of the gray paintings in a collection of excessively brilliant colorings. Only the dull crimson of the dwarf's trousers, the greenish tint of the woman's garment, a touch of blue at her throat and some dull green grass relieve the universality of the grays; even the hill, the hair and the grays of the skin are one and the same. The rich flesh-tones are swept over this gray undertone of the skin.

In using the term "excessively brilliant coloring" I do not forget that no one knows what "brilliant" color is. Zuloaga creates the impression that he is painting mural decorations, because of the usual flatness of his tones There is suggestion of the third dimension, rotundity, more than an insistance upon it. He outlines strongly often, like the leadings of a stained-glass window, and lays down his garments in a great flat mass of color. In the "Portraits of a Toreador's Family" intense greens predominate. The dress of the young woman on the right is in stripes of yellow-green and furious emerald green, both laid in long, unbroken strokes of the brush, nowhere varied by the effect of light falling on it, and contrasted by a violet jacket. The younger man next is in varied greens, his jacket braided with tarnished gold which glimmers in places. The other young woman has a light green shawl and gay red 'kerchief. The elder man also affects greens, and his stockings are pink. In the center, the old lady shows black and red-violet, sits in a vio-

"PORTRAITS OF THE FAMILY OF A GIPSY BULL-FIGHTER"

In this picture intense greens predominate and there is much glitter, including the gleam of exposed teeth

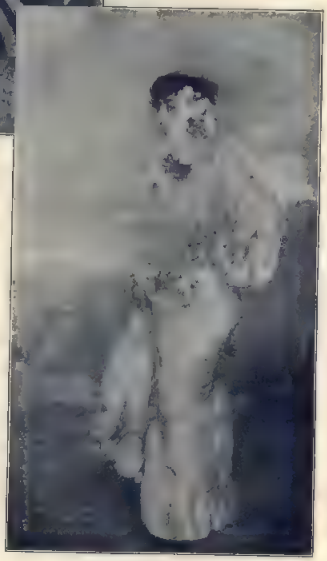
"THE DWARF GREGORIO"

The unbroken length of the gray shawl serves to heighten the tall figure in contrast to the dwarf

lently green chair and plays with a sparkling green fan. There is much glitter all about, not to omit the gleam of exposed teeth. These people are very dark-skinned, their color expressed in the richest of pigments. Some of the faces are powdered and, to us, decidedly uninviting.

Some artists esteem these brilliant colors wonderfully well found; others like them but little. However, they show the skill of an exceptional master of coloring. Zuloaga comes of a people who love gay colors. All over Spain the women wear very "loud" garments. "The Sorceresses of San Millan" is also a play in many greens, some decidedly strange tones of it, contrasted with small parts in dull red and a ground of neutral violet. In fact, Zuloaga loves to play with greens and does it as if he were enamored with experiments in unusual colors. Above all, there is nothing commonplace in his painting; rather he is intensely original and individual.

The "Mademoiselle Lucienne Breval in Carmen" shows the figure in a red so intensely brilliant that one wonders what pigment could produce it. There is red also in the background figures and a spot of blue on the pitcher and on a shirt. The face, in the strong "spotlight," is superlatively brilliant, a dazzling illumination. The shadow



"MERCEDES"

"VINTAGERS RETURNING IN THE EVENING"

Zuloaga painted these people as he found them in their native places

behind the figures is not purple, as indicated in certain color reproductions, but simple gray darkness. This is the most popular picture in the exposition. But it is so because obvious, and there are many others of deeper import.

Zuloaga has never studied in an art school anywhere. He is the product of hard labor in a Parisian attic on Montmartre all by himself. But it must not be forgotten that Paris is of itself a grand art school. One does not need to go to one of the academies in order to be instructed in art. People feed on art there. Naturally, his art is most unacademical. His father and grandfather were skilled makers of fine swords and other arms of defense, and were of international reputation. This son was apprenticed to the trade, but he longed to be a painter and wandered in the world. Scorning the reluctant aid of his doubting relatives, the young man turned to many shifts to earn his living, among them came a turn at bull-fighting. As a picador he conquered eighteen bulls, but was wounded by the last one, so that this sufficed and painting gained again its proper place in his affections. Tall and of superb proportions, he carried himself in the street as a picador should, pacing the pavement with measured movement and returning the respectful salutes of the populace with easy grace. He was a marked man in Paris because of this lofty bearing.

This tall man rarely paints an immense picture. The majority of the canvases on exhibition at the museum of the Hispanic

"MADEMOISELLE LUCIENNE BREVAL IN CARMEN"
The most popular picture in the exhibition at the museum of the Hispanic Society of America in New York city

Society of America, in New York, were but little over six feet in height. Some small solidly painted landscapes, looking much like tapestries, were evidently conventionalized wall decorations, not actualities such as Sorolla would have made. In this connection it is proper to express the serious debt of gratitude owed by the United States to the Hispanic Society of America. This institution, founded by a lover of Spanish things both ancient and modern, has a beautiful museum in New York, where are collected numberless rare Spanish antiquities. Its founder, Mr. Archer Milton Huntington, from purely patriotic motives and in order to cement more perfectly the good understanding between Spain and America, undertook to make us acquainted with the two greatest painters which modern Spain has produced, and these two are making a wonderful record for themselves and their country. The society paid all the expenses for bringing over Zuloaga's and Sorolla's pictures, gave the entire building over to the showing of them, opening the doors to the public without a door fee, printed catalogues and books of biographical and critical articles on them, superintended the sales of many works and turned over the full amount of the purchase money to the artists without deducting any commission. It was a princely act worthy to be recorded in history. Both the artists are painting many portraits in America, mostly commissions secured through the kindly introduction of the society.

REHEARSING A SCENE FROM "LES MISÉRABLES"
The players are directed by the stage manager, who stands at the left with a megaphone. Meanwhile the photographer is focusing his camera

# Picture Plays

By

## Edward W. Townsend

Mr. Townsend's long experience as a newspaper writer gave him a broad and intimate knowledge of the life of the city, especially of those parts of it where the picture play makes its strongest appeal and finds its widest patronage. This knowledge found expression in the humorous sketches of which Chimmie Fadden was the central figure, and in other books from Mr. Townsend's pen. He knows the stage, not only as a playgoer and critic, but as a dramatist, for he has written several plays, one of which is to be produced in New York this winter. He has also, as he tells in the following article, written picture plays. This is doubtless quite a different art from that of the "legitimate" dramatist, but it perhaps requires no less of the dramatic sense and power of construction.—THE EDITORS.

"PAUPER" is about to be crowned; the coronation chamber fills with notables, courtiers, soldiers, and high officials of the court, and finally "Lord Bishop" enters, following "Pauper," who ascends to the throne; "Bishop" takes the crown and is about to place it upon the supposed Prince's head, when the real Prince enters. Now for a few seconds the general movement among those composing the swiftly changing tableaux becomes less active, but the dramatic situation is more intense; more depends, picturesquely, upon expression than upon large movement; the turn of an eye, the movement of a lip, now interprets the story of the play, and as eye and lip move more rapidly than the whole body, the operator at the camera accelerates his work—twenty-two pictures a minute are now being snapped instead of sixteen or eighteen. Not the slightest

expression of "Prince" or "Pauper" but is caught and fixed upon the film.

"Moving pictures" they were generally called a few years ago, when rushing express trains, racing horses, or marching troops were shown on the screen. Now it is more proper to speak of picture plays, because the present state of this amazingly developed industry of entertainment is largely along the line of picturing plays—tragedy, drama, comedy, and farce—with all the details of the theater stage except sound and variety of color. Color is coming, and the inclusion of sound, the spoken word, the song, the orchestra, is within sight and hearing of the experts who in many parts of the world are at work to effect synchronous and convincing co-operation of sound and movement reproducing machines.

When I was first asked to write picture plays, my mind promptly did a bit of picture-making on its own account; I mentally saw as the staging scene for such work a stuffy photograph gallery and a squad of undrilled models—photographer's models! But it was suggested that before deciding upon the offer I visit the Company's studio in the Bronx.

I speak specifically of the theater of the Edison Company only because I am more familiar with that than with others, but in a general way the description will answer for the theaters of the several other licensed American moving-picture makers. Picture-play workshops are called "studios" by those working in them, probably because in the early stages of the work they were little more than large photographic studios, and the name clings, although the workshops now are theaters with stages, paint bridges, property and costume rooms, actors' dressing-rooms, stage carpenters, and all that pertains to the theater except the auditorium. I found at the Bronx establishment a stage twice as large as that of the Metropolitan Opera House, large enough, indeed, for the production of two plays at one time, as is sometimes found necessary. The nearest resemblance to a studio was in the glass roof covering the great concrete building; and that slopes to the south, instead of to the north light as in artists' studios, for the work requires all the daylight which can be coaxed to shine upon the stage.

Here we are, then: a roomy stage with its paint bridge, as in the real theaters, suspended high against the back wall, all the familiar mechanical devices of the theater stage whereby demons or clowns may be shot up or down through trap doors, where fairy aviators may be suspended and swung in birdlike flights from regions aloft, corridors with men's and women's dressing-rooms opening therefrom, a greenroom with waiting players in makeup chatting shop, and offices for the stage managers and executive staff.

Work preliminary to production runs parallel with that in a Broadway theater. Plays, some in scenario form, some fully developed, are received by every mail and examined by professional readers, who select the possible for managerial consideration. Those finally accepted, if in scenario—the sketch of a play—are given to a playwright to be fully developed. In their final form plays are turned over to a stage manager, who first proceeds, as does his brother of Broadway, to draw off scene plots for the painters and carpenters, and property and costume lists for those in charge of those departments. Then the people of the play are cast. This may be done from the stock company wholly, but if the play requires a player of specialized talent not found in the company, the part is filled by selection of some player engaged elsewhere, but at liberty to work by daylight in the picture-play theater.

Up to this point the familiar stage routine is followed, but thereafter all is changed. This is first observed in the work of the scenic artists; they paint only in white, black, and gray, for the camera still ignores colors. But the work the painters produce when mounted and set by the carpenters is no less detailed and complete than that used in other theaters. And this provision of scenery is an expense which exceeds the scenery cost in other theaters. An elaborate set is painted, mounted, and set up for, say, one of six scenes in a play; the scene takes three minutes to photograph, the camera man examines his films, and, if he reports "all right," the stage manager calls to the stage hands, "Strike!" and, instead of the scenery being moved to the rear, or to one side, or hoisted out of sight, to be used many times again, it is forthwith

ZOÖLOGICAL EDUCATION BY MOVING PICTURES
The biggest lion in the Zoo in repose, and roaring

A WINTER'S TALE
One scene in a picture play

instantly destroyed—reduced to lumber débris and painted rags.

The players respond to the first call for rehearsal made up and dressed for their parts, because they may be photographed in the scene only after one or two hours' rehearsal, and when they are "pat," there must be no delay for dressing, or they may come back "stale." They are instructed and drilled in the situations in which they are to appear, the story they are to tell and the emotions they are to portray by gesture and play of feature alone, and just at the moment that the stage manager finds they are keyed right the camera begins to snap—there must be no delay then. The principal people have probably read the play, and have done some rehearsing before a mirror; but minor people depend upon instruction at rehearsal to learn how their movements and expressions are to help interpret a story they never know.

While the stage manager is drilling the players the operator is adjusting his camera, an expert is controlling the amount and direction of light, and the stage hands are fastening the last grips, or possibly hanging a practical door to be used in the scene. One notices that some players are natural pantomimists, while others find it difficult clearly to express emotions which are supposed to direct their actions unless they have lines to speak. As picture-play manuscripts consist largely of descriptions of character, explanations of emotion, instructions for entrances and exits, and other stage directions, and contain but few lines (and those merely for guidance), those players who must talk to act exercise their wits in inventing lines, sometimes with surprising results. In a play of my own there is a scene on a tenement roof, in which a stout old Irishwoman comfortably gossips with a sky-parlor neighbor. Enter a tenant who pretends to be an honest peddler, but who is more than suspected of being a sneak thief—and looks it. During rehearsals the capable actress playing the Irishwoman had admirably expressed her objection to the presence of the thief with action and muttered rage. But when the scene was on, the camera clicking sixteen pictures a minute, the stage manager shouting warnings and directions designed to keep every one keyed up, the actress suddenly found need of speech to help her express her objections to the thief. Her sputters of honest rage were not enough. Staring at him as he deposited his fake peddler pack near her, she exclaimed, with a quaint backward jump of her memory to aid extempore speech: "Get along wid ye, thief that ye ar-re! Sure it's little ye look now like ye did whin I seen ye last, playing dude wid Jahn Drew!"

This was too much. The player thief had appeared in a Drew company as a fop the while the player Irishwoman was sweeping the stage in the finery of an aristocratic dowager. The pathetically drawn face of the thief twinged with the pain of effort to control expression, but all illusion was suddenly shattered by a hearty guffaw—and the scene had to be started all over again.

Some of the picture-play makers do inside or "studio" work exclusively, some outside work altogether, and some, like the Edison and other American makers and the best of the French, combine inside and outside work at times, but give preference to wholly inside work. The reality of outside pictures gave them their first popularity, but inside work is better, and the players dislike outside work. On the streets they are the objects of overcurious observation and subject to outspoken criticism. The conditions make a seeming paradox: greater reality is effected by artificial effects; the players perform better when surrounded by painted scenery and the trappings and atmosphere of the stage. Maurice Barrymore once drawled at an advocate of "stage realism:" "After all, old chap, there is not so much art in real water as in a water cloth heaving in billows produced by a squad of supers trained by Dave Belasco to rise and kneel in wave-like rhythm."

Picture plays must tell stories which can be plainly interpreted by action, and that they are so told, and generally well told, justifies a dictum of Hugh Ford, who produces plays for the Liebler firm. To an anguished playwright lamenting cuts of his lines, Ford replied, "Every substitution of action for lines increases the chance of your play being a scream instead of bloomer."

A full-length picture-play film is about 1,000 feet long and contains about 16,000 separate pictures of a play which takes about eighteen minutes to "perform"—that is, to be projected on the familiar screen in the darkened theater. It will surprise those who have seen these picture plays shown on a screen 12 x 16 feet to learn that the pictures on the film are but three-quarters of an inch square; but that surprise will be nothing to that of the amateur photographer when he learns that the expert workman who develops 16,000 negatives at once could, with perfect comfort and propriety, wear white kid gloves while doing so, for all that process, so dire and dirty to the amateur, the washing, fixing, drying, and whatsoever else which harrows the mind and blackens the hands of the amateur, is done at the studios in and through and by electrically operated vats and drums and

ACTING A PICTURE PLAY

The stage manager (who is gesturing fiercely at the right) is a very prominent figure in the action on the studio stage. But being outside the range of the camera, he appears not at all when the play is thrown upon the screen in the picture play theater

A FIGHT IN MIDAIR AS ACTED IN THE PICTURE PLAY THEATER

A part of a full-length picture play film enlarged. Begin at the top of the left-hand corner and look down columns 1, 2, and 3

A SCENE IN THE PICTURE PLAY THEATER

The players are surrounded with all the details of the stage of a real theater. There are only lacking the spoken word and color—the scenery is painted in black and white

spindles and whatever. The long roll of film, having been developed, is sent to the department where are made as many duplicates, positives, as are required for the trade. The distribution of the reproduced reels throughout the world is in the hands of agencies, who act for the manufacturer as distributers of periodicals act for magazine publishers.

A good purpose is well served through a friendly agreement reached between the principal picture-play makers and the organized representatives of a number of well-known church, ethical, charity, and political societies. With the resolve to raise the standard of their output ethically and artistically, and especially to discourage and, if possible, wholly prevent the making and display of pictures objectionable to the moral or physical senses, a combination of makers known as "The Licensed Manufacturers of Films" volunteered to submit, without appeal, all of their pictures to the Committee on Censoring of the National Board of Censorship, composed of men and women representing the City Vigilance League, Ethical Society League, Federation of Churches, League of Political Education, Neighborhood Workers' Association, People's Institute, Public Educational Association, Public Schools, Society for the Prevention of Crime, Woman's Municipal League, and the Association of Moving Picture Exhibitors of New York State. On one day of each week the Censoring Committee meets in a room in Fifth Avenue, New York, where the previous week's output of the licensed makers is displayed on a screen, and a vote of the censors is passed on each picture shown. The sincerity of the makers in entering into this compact in the interest of public morals has been tested: two or three films have been voted against, and, without protest, the makers have thrown the censored films on the scrap heap, although in no instance was the objection based upon a question of morals, but of taste in the matter of entertainment for women and children. Under this plan is submitted the work of these American makers: Biograph, Edison, Essanay, Kalem, Lubin, G. Melies, Selig, and Vitagraph Companies; the Gaumont and Pathé

Frères Companies, of Paris; and the Urban Company, of London.

It is a big and important business, with such authors as Mark Twain supplying literary material; with such artists as Mlle. Pilar Morin interpreting stories before the camera. But its greatest importance lies in the fact that it supplies practically all the dramatic entertainment for millions of eager seekers for such form of amusement.

And is it not possible that this business of manufactured amusement for hundreds of thousands daily may exert an influence upon those who make the dramas for the vocal stage? I even venture the opinion that one contributing cause of the failure of a number of plays within the last year can be traced to the influence of play pictures. Each year thousands of new theater-goers come from the number of those whose previous knowledge of plays has been largely gained from moving-picture plays, in which a dramatic story has been told by action alone. It is of some significance, surely, that of a score of plays withdrawn as failures in New York within the year the most common complaint against them has been that they were "too talky." It is a bold thought, and one summons all his hardihood to suggest it, but Mr. G. B. Shaw might have prospered more on the stage had he not chanced to seek success just when the picture play had come to prove that the less the player says and the more he does the more chance the play has for success.

## THE FAIRIES' LAMENT

BY MARIE CONWAY OEMLER

We are banished from the trusting heart of childhood,
We have vanished from the valley and the glen.
And the daisied upland slopes, the ferny wildwood,
All have lost the flitting forms of fairy men.
Cold and empty are the couches in the flowers,
Long deserted is the circle 'neath the moon.
All forlorn the feasting places and the bowers,
And the world has lost the lilt of elfin shoon.

When the moonlight's magic spell is on the meadows,
There is none to hear us calling shrilly sweet;
In the secret twilight's shy and shifting shadows
There is none to note the flight of fairy feet.
Every hill is bare of scarlet cap and feather,
And the lonesome moor no mystic music croons;
Elfin ale is brewed no more amid the heather,
And but drifting dust are they who read our runes.

You have lost us; we have vanished from our places,
We whose joyous lore was born of Spring and Youth.
If you long to glimpse again our wistful faces,
You must seek us in the land where Dream is Truth;
Where the blighting storm of reason never rages,
Where no doubt may dim that clear and cloudless clime
Where the happy heart of childhood never ages,
In the lovely Land of Once upon a Time.

DRAWING WHEAT NEAR MODESTO CALIFORNIA

# THE PRICE OF THE LOAF

BY

CHARLES MOREAU HARGER

"WHY, in this age of agricultural development, when great harvests are rolling in from wide areas, when farmers are prospering and their lands are producing as never before, must I pay more for a loaf of bread—or get a smaller loaf for the same money?"

This question in many forms has been asked repeatedly of late in every village and city of the Nation, and the answer has not been always clear.

"We have more to pay for our flour," from the baker, does not explain fully.

"Our wheat costs us more," from the miller, is not, of itself, satisfactory.

Experiences of the past few months with the problem of the size of the loaf of bread have intensified the consumer's interest in understanding conditions that to-day surround the production and marketing of the greatest food staple of the world—wheat. Widespread and many are these influences, each with its relation to household economics, particularly to the supply of daily bread.

For instance, the householder forgets that, though he hears so much of the crop of our own Middle West, Europe, with its smaller land area, produces more than twice as much wheat as North America. Italy last year raised twice as much as Kansas, and Germany more than four times as much as Illinois. The wheat-fields of Europe aggregate 120,000,000 acres, of which forty-seven per cent are in Russia; those of the United States 47,557,000 acres, of Canada 6,610,000 acres, these comprising practically the entire wheat acreage of North America. France, despite its varied industries, raises half as much wheat as the United States, and Spain nearly twice as much as Minnesota. South America raises a third as much as our own country, Australasia and Africa one-sixth as much, and Asia two-thirds as much. So it is a world crop, the one cereal meriting that title.

Of direct interest to this Nation, however, is the influence of American wheat-fields on world prices and world production, affecting the future of our own farmers and of our own consumers. The American farmer has found formidable rivals who must be considered in his plans for coming years. The acreage in Europe has been practically stationary for thirty years, except in Russia and Hungary. The latter shows an increase from 6,000,000 to 69,000,000 acres, and the former has doubled its fields. In the past sixteen years their combined area has grown ten million acres, and the production a hundred million bushels.

Such larger acreage of wheat now exists also in similar proportions in South America and other newer wheat countries, and is necessary to keep pace with the increase

JUNE HARVESTING AT TULSA, OKLAHOMA

in population. Ever the reddish-yellow stream flowing from the farmers' wagons must furnish a margin of surplus for the hungry inhabitants of earth—and it is a narrow margin, for if harvests were to cease the world would eat up the surplus stock of wheat in its bins, granaries, and elevators in two months. Somewhere area and production must increase if the world is to be fed.

The United States has done its share in adding to this food supply. Not so long ago the farmer of the East and of the Middle States tilled laboriously his fifty acres of wheat land and carried grain to the old-fashioned mill, taking home his winter's flour and selling the remainder for shipment. Not until the Middle West was opened after the Civil War did the wheat-raising of this Nation take on importance.

Then it ran riot. Managed often by men unfamiliar with climate and soil in their new homes, experiments as often gave failure as success. If the latter, the product was hurried to market. The farmer had no alternative. He owed a long overdue account at the grocer's, another at the dry-goods store, a third at the implement dealer's, while the interest on his mortgage note must be met. If the former, he renewed his mortgage and increased the size of the note.

"About the only time I saw real money," a pioneer farmer of the wheat belt expressed it, "was in the brief interval between unloading the grain and making the rounds of my insistent creditors."

In other words, the wheat-raiser was a speculator, working on borrowed capital, trying experiments, and hoping for vast rewards. In those days transcontinental trains were halted between great wheat-fields that the passengers might gaze on golden acres which realized all their dreams of agricultural splendor. If next year the wheat failed, many of the settlers, discouraged, left their homes and went "back East to the wife's folks."

But they returned in the spring, trusting in the virgin soil and believing that timely rains would not fail again. In the end their faith has been justified.

From that condition to present methods of wheat production and wheat handling in the United States is a long step, one throwing some light on to-day's markets.

Complicated with it, however, are the rise and fall of per capita consumption, depending on prosperity's barometer and on the consequent wastefulness or caution that results. When wheat is low, consumption of flour increases; when high, other foodstuffs are substituted, unless the other foods, too, are high and it is no great economy to use them. It should be remembered, also, that our wheat prices depend at bottom on world production, whether or not we have a call from abroad that takes our surplus, or store it for ourselves. Producing last year 664,602,000 bushels of the 3,172,800,000 bushels raised in the world, and exporting one-sixth of our yield, the influence of the United States' production is of moment.

What has been the change in the American Western farmer's methods?

Principally he has learned properly to till his land. Not that he has reached a point of even approximate perfection, but he works with better system. Ten years of good crops, including nearly everything he produces, has relieved him from the feverish anxiety to trust to luck in the hope of winning a prize. He plows deeper and harrows more thoroughly. He studies the seed problem, and has comprehended something of the secret of breeding better grain. When the educational wheat train sent out by the agricultural college, a feature of every wheat-growing section of the West in recent years, stopped at his station, he listened to the lectures, asked questions, and then went home to practice the information.

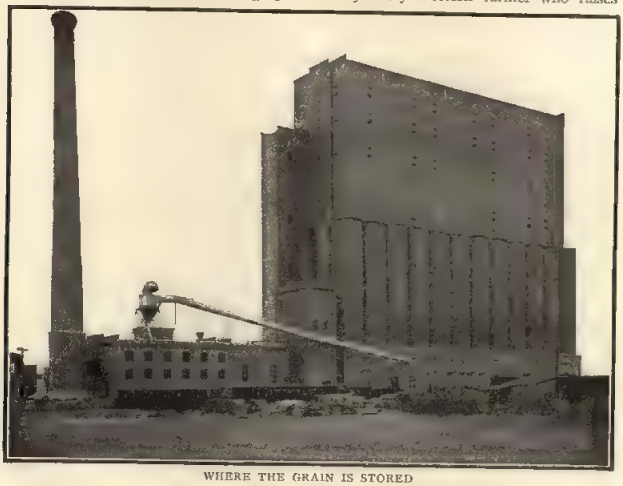
"I always thought raising wheat was guesswork, but it seems it is a science," one gray-haired pupil put it.

Along with this came two additional factors in extending the area. Experiment showed that with intensive cultivation wheat could be raised far beyond what was earlier considered the safety line—out in the semi-arid region of the high plains. This process, now known as "dry farming," is nothing more than so pulverizing the top soil that the dust blanket formed shall prevent excessive evaporation. Under these conditions less rainfall than otherwise will produce a crop. Hence wheat-fields are spread far toward the Rockies on prairies where first settlers considered the land worthless save for

THE CHICAGO WHEAT PIT

grazing. Government experimental stations throughout the wheat belt have added to the information needed to secure good results. In addition, irrigation has transformed hundreds of thousands of barren acres into fertile farms where phenomenal yields of wheat are produced with the regularity of the seasons.

Thus the American farmer has become a wheat expert after a fashion, and, aided by the more equable distribution of rainfall induced through the breaking up of



WHERE THE GRAIN IS STORED

sod, has been heaping up his yields year after year.

What does he do with it? He has passed the stage when he rushed from the elevator to the grocer, to the dry-goods merchant, and to the note-holder. His finances are well in hand. He can afford to wait. Every morning he receives from the rural carrier his daily paper. He is in touch with his neighbors and with the nearest towns by telephone. He considers the situation from a new viewpoint.

If he decides to follow the advice always being heralded, "Hold your wheat," he is able so to do. On hundreds of farms of the Northwest are private elevators built for the convenience of the farm-owner. Of frame, concrete, or tile, they hold 10,000 to 15,000 bushels; each is equipped with gasoline engine and cleaner, and places the farmer in an independent position. He may hold his wheat a year if he pleases, and be certain all the time that he has an undisputed asset.

This idea is spreading through the Southwest, and it will not be long until practically every Western farmer who raises 200 to 300 acres of wheat will have a place to store it.

Contrast this with such conditions as have existed within a half-dozen years, when tens of thousands of bushels of wheat have been heaped on the open prairie at railway stations because public elevators were filled to bursting and cars were lacking, while the farmers were compelled to dispose of the grain as fast as threshed.

Another thing: the farmers are becoming wheat dealers. In Minnesota there are 192 farmers' elevators; in North Dakota, 144; in South Dakota, 68; in Nebraska, 138; in Kansas, 87; in Oklahoma, about 50. The stockholders of

these companies are farmers, forty to seventy-five grain-raisers being interested in each. They handle their own and their neighbors' grain on a small margin of profit, seeking to save the middlemen's profits. At first they were opposed by the "line," or corporation-owned concerns; now so numerous are they that their business is sought by the millers and shippers, and they have become an integral part of the grain trade.

In their earlier efforts they frequently had difficulty in securing railway facilities. Now it is different. Said one manager: "We were for months unable to induce the railroad to build a track for our accommodation. We took the matter to the Railroad Commissioners, who looked over the ground, ordered the railway companies to give us a switch, and now we are getting two-thirds of the grain from our community. Twenty years ago the railroad would have laughed at us and we would have been powerless."

All this means that the Western wheat farmer is mastering the situation, and making of wheat-raising a business.

Reaching up into the Canadian Northwest is another wheat empire, marvelously developed in the past decade. There, too, are the farmers' elevators, a half-dozen of them sometimes in a single district. There, too, fertile soil is being broken, and is producing crops that make the farms dividend-payers beyond the expectations of the beginners. It matters not whether it be the winter wheat of Kansas and Oklahoma, the spring wheat of northern Nebraska, the Dakotas, and Canada, or the famed macaroni variety, promised to grow where other wheats will not, though considered inferior by millers —it all makes a part of the great volume of production, giving to the American farmer a commanding position in the world markets.

When to the great center of the wheat market of the world, Broomhalls of Liverpool, there come cablegrams of drought in Hungary, of Hessian fly in the Southwest of the United States, of rains in Russia, the price barometer fluctuates in quick response. The news flashes to the exchanges in every great city; it is carried to the farmer, and his hopes rise or fall accordingly. Last winter, when wheat sold at the same price on the plains of America and in Liverpool, he sought the reason. He found it in a world shortage —the aggregate crops of 1908 and 1907 had been nearly 600,000,000 bushels less than those of 1905 and 1906. Yet the world had gone on eating. Only by looking at the world product could the farmer find reason for his local conditions. In the grain headquarters of Europe, as well as in our own milling centers, was evident great difficulty in securing supplies.

At the same time some forty million bushels of wheat were locked up by Chicago speculators and other great dealers, on the expectation that they would get higher prices by holding. This feeling extended even into the farming sections, and not until the farmer's dream of "dollar wheat" was realized, for the first time in many years, did the grain come freely to market.

"It is an odd fact that selling is slower on a rising market than on a falling one," said an interior miller. "When wheat was bringing $1.25 a bushel, nearly twice the price of four months previous, grain came in slowly. Then one day it fell off to $1.20, and a dozen farmers hurried to town with loads of grain." So it was that the wheat supply was held up while the prices advanced.

Along with it went some features not easy to explain. The American crop of 1908 was estimated at 664,602,000 bushels, against 634,087,000 in 1907. Here was an original supply 30,000,000 bushels larger than in the year preceding, yet we exported 7,000,000 less than in the year before. The consumption of wheat must, then, have greatly increased, the Government overestimated the yield, or there was more wheat on hand than the speculators claimed. But the fact that wheat was high abroad indicated that the world shortage was real. One of the favorite contentions of the Patten combination was that, had it not been for storing to control prices, wheat would have left the country and the prices of wheat and of the loaf of bread would have been greater than actually resulted, because this country would have been drained of its wheat by early spring. Whether or not this is true, the world has been in a critical condition regarding its wheat problems

BUSY THRESHING WHEAT

HARVEST TIME AT

for the past twelve months, and it is not certain that the end has come.

Figures are not dry reading when they apply to the loaf of bread. Here is a series of annual wheat yields in thousands of bushels, our own Department of Agriture's estimates being used:

| | United States. | Europe. | Whole World |
|---|---|---|---|
| 1908 | 664,602 | 1,751,696 | 3,172,814 |
| 1907 | 634,087 | 1,691,395 | 3,142,150 |
| 1906 | 735,261 | 1,867,875 | 3,432,688 |
| 1905 | 692,979 | 1,865,356 | 3,330,447 |
| 1904 | 552,400 | 1,791,756 | 3,163,562 |
| 1903 | 637,822 | 1,900,183 | 3,189,813 |
| 1902 | 670,063 | 1,902,320 | 3,148,517 |
| 1901 | 748,460 | 1,574,700 | 2,945,275 |
| 1897 | 530,149 | 1,252,158 | 2,233,637 |
| 1896 | 427,684 | 1,598,056 | 2,506,320 |

Since 1906 Europe has been running short of its best yield. In 1905 Australia and Argentina filled the void, and in 1906 the United States made up the shortage. Since then it has been a hand-to-mouth business, with progressive exhaustion of reserves. Had Europe and America both fallen below normal this year, the loaf of bread would shrink yet more. Conditions in the end must come to one of two things—the supply will be sufficient, or the elasticity of consumption will make adjustment to the situation. Thus far in the world's history nature has been generous.

In 1897 and 1879, when Europe's crops ran disastrously short in the face of low supplies, America produced a bumper yield. In 1893, when our wheat was a disappointment, Russia and Austria filled the needs of the occasion. Not since 1881, the famous "famine year," have both continents fallen short.

The problem of the wheat price has thus been kept reasonably steady. At least there has been no shortage maintained long enough to become a permanent situation, such as has been predicted by many economists as inevitable at some period of the world's history. That there are yet great areas capable of producing wheat is unquestionably true, but much of this will not be opened and properly cultivated until there is a permanent high price for that cereal, warranting the expenditure of capital and development.

In our own country no such expansion of the wheat acreage is possible as has been effected in the past two decades. The tide of immigration has already reached to the foothills of the Rockies, and farms dot the plains. Even the valleys of the mountain ranges are being utilized, and the increase of production must come rather from more scientific farming than from greater area.

However, within certain limits wheat acreage does fluctuate. One year come low prices, and the next year farmers fail to plant the usual amount; or the prices of other grains are high and the farmer plants corn and oats instead of wheat. "Even with wheat at a dollar, I make as much from my corn at present high prices as I do from wheat—and with less anxiety at harvest time," said a Middle West farmer a few weeks ago. While this condition exists he will not increase

THE 101 RANCH

his wheat acreage, and may, indeed, lessen it. Then there is always a variance from the fall-sown area. In spring "green bugs" may destroy a portion of the fields of the Southwest, or late frosts, as in 1907, may cut down what seems like a record-breaking yield—all these cause an ebb and flow of the total harvesting that makes the ultimate yield an uncertain quantity.

All the time a million inhabitants are added each year to this Nation's population and more mouths are eager for the loaf of bread, and, should there be established a permanent market of one dollar or more a bushel, it is fair to reason that in ordinary times the farmer would be stimulated to sow more acres and to raise more bushels to the acre.

Scientists and statisticans frequently show that there is a limit to the area capable of wheat-raising, but they sometimes fail to take into account the possibilities of better methods of agriculture. In Germany average yields of 29 bushels to the acre are reported year after year. In the virgin soil of Alberta last year, according to the Canadian Department of Agriculture, the average for fall wheat was 29.7 bushels per acre and for spring wheat 22.6 bushels. In Minnesota the Government estimate was 12.8 bushels; North Dakota, 11.6; in South Dakota, 12.8 bushels; and in Kansas, 12.5 bushels. To be sure, the older lands had been tilled for many years, but there will be found ways in which the soil can be replenished and the yield increased—particularly if there shall be a large profit therein. It costs approximately $8 an acre to sow and reap an acre of wheat ground on the Western plains; the profit in a yield of, say, 20 bushels to the acre at a dollar a bushel is apparent; it contrasts sharply with 13 bushels at 60 or 70 cents a bushel, as has been the experience of some seasons.

"Could you raise more wheat if you tried?" was asked of a Western farmer.

"Certainly," was the prompt reply. "It would take more work and cost more in labor, but I would do it if it paid. One farmer of my State tried an experiment on fifty acres. He cultivated it three times, and when he sowed the seed, the field was like a garden. It produced forty bushels to the acre. On the remainder of his wheat land, prepared in the old-fashioned way, he reaped sixteen bushels an acre—less than one-third as much as from the well-cultivated field. Any one in a favorable year can do as well with sufficient tillage. In the agricultural experiment stations it is common to raise year after year an average of twenty-five to thirty bushels an acre; the farmer can do that, too."

That tells the whole story of where the wheat is to come from with which to feed the increasing population; but some part of the dwellers on farms will have to mix more science with labor, and will have to doff coats and roll up sleeves to put the soil in condition to double or treble the yield.

The transportation facilities of the

*The Basin at Manchester*

# THE STORY OF THE MANCHESTER SHIP CANAL

BY

J. PAUL GOODE

PROFESSOR OF COMMERCIAL GEOGRAPHY, THE UNIVERSITY OF CHICAGO

*Professor Goode was appointed Commissioner by the City of Chicago to investigate the harbors and ports of Europe. In view of the present interest in our inland waterways and their bearing on railroad rates, Professor Goode's article, showing the results of the solution of a similar problem by the city of Manchester, is particularly timely.*

ABOUT the busiest industrial region on earth is the lowland of England flanking the Pennine Hills from Lancashire and the Mersey River on the west, round through the valleys of the Trent, Ouse and Tees, to Newcastle on the Tyne in the northeast. Here are scores of cities and towns, the home of the textile industries, the potteries, the great shops busy with iron and steel and other raw materials, manufacturing goods of high value for a market as wide as the earth.

And over all this lowland hangs a black pall of soft-coal smoke, the landscape studded with the tall spouting chimneys. For all this endless activity in manufacture is wholly due to the location in these lowlands of fabulously rich deposits of coal. And coal for a century and a half has been a magical bank account in Great Britain, dominating and conditioning all industrial activity, bringing into existence these great artisan populations, making demands on every continent for the metals and timber and textile fibers for the busy mills, and then calling on the farms and ranges of America, the Argentine and other new lands, for the bread and meat to feed these industrial millions.

It was in this northern lowland a century and a half ago that the modern textile industry was born; the sheep of the Pennine Hills and of the rich farms fur-

THE BUSIEST INDUSTRIAL REGION ON EARTH

A map of the lowlands of England showing the Manchester Ship Canal

nishing the wool for an extensive cottage manufacture. And then came the invention of the spinning jenny and the power loom. At once the demand for wool far outran the local supply and new lands over seas were called upon for more wool. Then Eli Whitney's cotton gin brought the cotton industry into existence in America, and the natural market for the lint was in the world's textile metropolis in the plain of Lancashire. Here the climate was right, the skill had been bred into the workers, the cheap coal was at hand to turn the spindles, and the Mersey led out to the western sea, the great highway of the world's traffic.

Thus for a century the textile industry has been the greatest of all the industries of Great Britain, and the plain around Manchester has been dotted over with towns, the names of which have become household words wherever cotton and woolen cloths are used: Bolton, Oldham, Rochdale, Huddersfield, Bradford, Leeds. Of all this textile territory Manchester is the central market and clearing-house. In the Manchester Exchange one hundred and seventy-seven towns are represented, eleven of them having each a population of one hundred thousand or over.

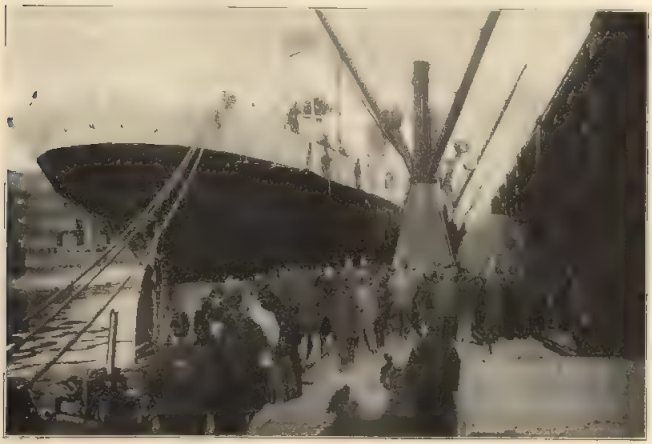
But to get the cotton and the wheat and meat from America, and to get the manufactures out to the markets over seas, Manchester and all the towns about her have been dependent upon the port of Liverpool, the natural gateway of the textile region; and upon the railways between Manchester and Liverpool. Now in Great Britain, as in America, the railways are privately owned and very powerful. And though they are much more closely guarded and regulated by government than they ever have been in America, nevertheless, with gentlemen's agreements and other comfortable arrangements, they very largely have their own sweet will in handling the goods of the realm. Moreover, the port of Liverpool is managed by a trust, very efficient, well-nigh perfect in organization, with an absolute monopoly in the business of the port. Facing the Atlantic, with a tidal range of thirty-one feet, and wrestling with the shifting sands of the Mersey estuary, this trust has won, at enormous cost, one of the finest harbors in the world.

Now, there is no complaint as to the efficiency of this port authority, nor as to their desire to maintain the finest port service on earth. Yet, the merchants of Manchester felt that the railways were arbitrary, and charged too much for their services, and that the management of the port of Liverpool was done too much in the interest of the merchants and shipowners of Liverpool, and against the interests of the merchants and manufacturers in the lowland, of which Manchester is the focus.

Dull times came in the late seventies and early eighties; looms grew silent, and dwelling-houses were empty. And when large manufacturing enterprises, such as the big locomotive building concern of Sharp, Stewart & Co., Limited, were about to remove from Manchester to the Clyde, "in order to secure cheaper carriage," the public-spirited business men of Manchester, through the Manchester Chamber of Commerce and the Commercial Association, protested against these conditions. But protests were of no avail, the answer being always the arrogant taunt, "What are you going to do about it?"

At last a genius arose who said, "We can be independent of the railways, and of Liverpool, too. Let us bring the sea to Manchester and be our own seaport." The suggestion was infectious. It came out first in pamphlet by Mr. James W. Harvey. It was taken up by some of the most influential merchants and engineers of the community: Mr. Daniel Adamson, Sir James Abernethy, Sir E. Leander Williams, and others. The newspapers took it up, and Manchester has some of the finest newspapers on earth. Public meetings were held. A regular campaign of education was carried on with discussions of plans and costs and ways and means. Gradually all hands came to agree upon the feasibility of the scheme. The one conviction in everybody's mind was that "the sea and canals do more to bring down railway rates than any competition among the railways themselves." So the timid were reassured, the conservatives were captured and finally a united and enthusiastic community demanded the execution of the work.

Then the ablest engineers lent their aid in choice of route, and in determining methods and costs of construction. The public was aroused and subscribed readily



BREAKING A RECORD FOR RAPID UNLOADING
The electric cranes at work at the Manchester Basin

to the fund required to go to Parliament for the necessary powers.

The problem was indefinitely difficult, for to get an enabling act with powers adequate, they had to do battle royal with every vested interest in the kingdom that could be engineered against them. There were all the railways in the region, every one with visions of traffic to be lost between Manchester and the sea; there were all the land-owners along the thirty-five and a half miles of the proposed canal route, whose interests would be affected by condemnations for right of way, and by the digging and dredging, and endless commerce of the route; there were the Bridgewater and the Irwell canals, one crossed by the right of way desired, the other occupying a part of the desired right of way; there were all the various small towns along the route, with rights in highways and waterways, and drainage which would be changed by the making of the great ditch; there were all the powerful ship-owning interests of Liverpool whose business would be affected; and, lastly, there was the port authority of Liverpool, which had spent $150,000,000 to develop a great port with all its varied interests, which would lose in tonnage and in income by exactly the measure of the growth of a rival port in the hinterland.

UNLOADING LUMBER AT THE SHIP CANAL DOCKS AT MANCHESTER

In the distance is a great grain elevator built by an American engineer. Its unloading "sea-leg" rises high above the masts of the ocean steamer at its base

Now, getting an act of Parliament is quite a different matter from getting an equivalent power in America, and the act when obtained is a very different affair also. When the bill in Parliament is under consideration, opportunity is given for every opposing interest to be heard. Every conflict must be arbitrated, and every uncertainty settled before the bill becomes an act. It is a good deal like getting married. If anybody has any objections he must state them then and there, or forever after hold his peace. So when the act is passed, its powers are definite. It does not have to run the gauntlet of the courts to be sure of its powers and to be sure it does not controvert the Constitution. Parliament, not a court, is the

ultimate authority, and the act is, itself, so soon as passed, a part of the Constitution.

Thus, it will be seen, the bill to permit Manchester to make a canal, called for the services of the ablest attorneys and special pleaders, very expensive men. Large retainers were given, and almost daily "reminders." And a committee of prominent men must be sent to London to keep in touch with eminent counsel and be sure the requisite evidence and fuel were supplied. Progress through Parliament is sure to be slow and expensive, in proportion as the measure is important.

The Manchester people entered their first bill in December, 1882, but, after a stormy session, it met its Waterloo in the House of Lords, the stronghold of vested interests. Not disheartened, the friends of the measure entered another bill at next session and, after a bitter fight, it, too, was lost. This fired the whole region to the support of the measure, and a third bill was introduced in December, 1884, which won its passage and received royal assent August 6, 1885.

It is rather instructive to read the comment, "The provisional committee spent £172,000 to obtain the act." That is, just to get permission to make a canal cost $860,000. It was estimated that $2,500,000 was spent for and against the measure, before the act was passed. But it is food for sober reflection for us in America, that in all this preliminary warfare not one whisper or suspicion of graft or unfair play was ever raised on either side.

The act provided an organization which is somewhat anomalous in port administration, that of a stock company, "The Manchester Ship Canal Company," the stockholders choosing the officers and determining the policies. But the purpose was avowedly to serve the common good; not to work for profit, but to establish fair play in the handling of goods to and from the city. In effect it was a public trust seeking the same powers as the rival trust at Liverpool.

ONE OF THE GREAT GRANITE EDGED LOCKS

The bridge in the distance, seventy-five feet above the water, is one of five that had to be built for the railroads

When the act was passed, a patriotic public subscribed for the stocks to the extent of nearly $50,000,000, and work was begun. But the engineering difficulties and costs were greater than could be foreseen, and the company was compelled to ask the corporation of Manchester to come to their assistance with a loan. The city furnished the loan, and later another, a total of $25,000,000. The canal, however, was not opened for traffic until November, 1893, and since there could not be a dollar earned until the whole work was complete, the interest on loans fell into arrears, and a new obligation of over $5,000,000 was incurred for interest. The city supplied this and demanded representation on the board of directors, so that the directorate now stands, ten elected by the shareholders, eleven appointed by the Manchester corporation. Thus, at the present, the control of the canal is dominantly municipal. It is, in fact, what it was in spirit from its inception, a public venture, for the public good. The semi-annual meetings of the board are held in open session in the city hall, and attract wide attention. The financial report is public property, and is carefully watched.

It was a gigantic venture to bring a channel twenty-six feet deep thirty-five and one-half miles into the land, and lift it sixty feet and six inches above the sea. The great ditch is from 290 to 370 feet wide at top and 120 feet as a minimum width at bottom. Five locks had to be provided to keep out the tide and overcome the sixty feet rise. Within the last year the depth has been increased to twenty-eight feet. Forty-six hundred acres of land had to be bought, at a cost of $6,435,025, or about $1,400 per acre. Two small canals, the Bridgewater Canal and the Mersey and Irwell, had to be bought outright at a cost of over $6,000,000. Five railway crossings had to be provided, with high level bridges seventy-five feet in the clear, and approaches graded to 1-135. The total excavation was over fifty-one million cubic yards, or over half that of the Suez Canal. The canal at the present moment has a cargo capacity for three hundred and sixty days of one hundred and fifty million tons. Over seventy vessels a day can pass the locks.

The magnitude of the undertaking is seen by a statement of the capital created by the company, which up to June

THE CANAL WITH THE RIVER MERSEY ON THE LEFT

Manisty Mount in the distance consists of 4,000,000 tons of spoil taken from the canal cuttings

30, 1907, was £17,084,281. That is a total capital expenditure of over $85,000,000. When Chicago made the Drainage Canal, it was a great undertaking and all the world heard of it. But Manchester, with only a fraction of the population or wealth of Chicago, has raised a sum vastly greater than the first cost of Chicago's canal. And this English canal was a private venture, which must pay interest on all funds borrowed, and is taxed by the government the same as any other private business. Upon the capital created by loans and debenture stock, $50,000,000 is at three and one-fifth per cent interest; $15,590,000 is at three and a half per cent, and $10,980,000 at four per cent.

The promoters of this great canal had the advantage of the knowledge of a century's experience in expansion in the ports of Great Britain. It is very instructive to notice that from the first the plan was for a complete monopoly of the business of the port. Within the common restrictions imposed by Parliament upon all ports in Great Britain, there is complete freedom in the assessment and collection of dues and fees on ships and on goods. Everything is owned and worked by the company; the docks, piers, wharves, quays, sheds, warehouses, railway tracks, locomotives, cars, lurries, motor trucks, cranes, shears, legs, pipes, chutes, floats, tugs, scows, barges, lighters, pontoons, flats and every other device used in handling the freight to and from the ship. Vessels may be loaded or unloaded by their owners if they wish, and if not, it is done by the company. There is but one employer or contractor in the port, and thereby the labor situation is much improved. It is possible to increase the number of men given continuous work through the year, thus reducing the number of casual laborers, so much a problem in all the ports of the world. Hence the quality of labor is kept at a much higher level, and strikes are almost unknown.

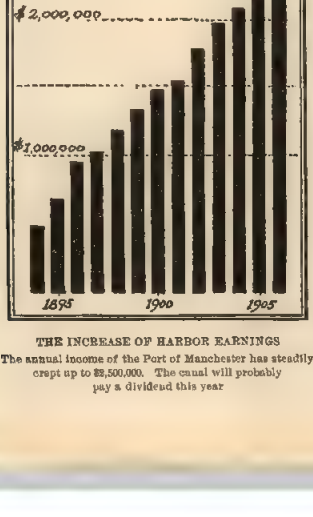
As is usual in Great Britain and the continent, the quality of construction is high. Quay walls are of masonry or concrete, faced with vitrified paving brick, and coped with great blocks of granite. Sheds are wide, of brick, or, better, of reinforced concrete faced with brick, the best type being four or five stories high. In the newer ones the roofs are flat, and of concrete, carrying traveling cranes on the edge and served by elevators, and available for the storage of lumber, casks or other goods which can stand the weather. The cranes are electric, either on the roof or on tracks on the edge of the quay, and are most efficient. Railway tracks are provided on every quay, for direct loading or unloading. Tracks also run through the sheds to be served from the sorting floors. The company owns its own cars and locomotives, and does its own switching, and has ample siding yards where trains are made up.

The people of Manchester made this prodigious outlay of $85,000,000 to be free in the matter of the movement of freight. "A working district as big as a small nation made this supreme effort in a determination to break a grinding, and increasingly indifferent, monopoly." Manchester is now the nearest port for a population of 8,000,000. The wisdom of the great venture must be sought in the influence the canal has had upon freight rates. The evidence makes good reading. Mr. J. K. Bythell, chairman of the Manchester Ship Canal Company, before the Royal Commission on Canals and Waterways, the sixty-seventh day, Tuesday, November 26, 1907, stated that on the promotion of the canal great reductions were made in the freight rates on the principal commodities between Liverpool and Manchester. Again, just before the opening of the canal, other considerable reductions were made. But the largest changes in rates were between Manchester and the ports of northern Europe, where reductions of thirty to nearly fifty per cent were made on the principal commodities. Dock dues at Liverpool were also largely cut down; for example, on wheat and maize there was a cut from thirty-two cents to twelve cents per ton.

After the canal company began to handle freight they found that they were discriminated against by the railways, and were in a good way to fail for lack of power in the control of freight movement. And here came just one suit at law in the critical history of the canal. They had to appeal to the Railway Commission and try a case in court, before they could get recognition from the railways as a statutory railway company, competent to make rates. They won their case, and now act

as a terminal railway company. So the railways are compelled by law to "tote fair" with the canal company, and if a railway company is "too busy" to take away the loaded trains, the canal company may take them out with their own locomotives over the right of way of the delinquent company. Thus the local freight situation is controlled absolutely by the canal company.

The company now makes an active campaign among individual shippers, furnishing them through rates to or from any point on earth, every expense and terminal charge included, and can demonstrate a cheaper rate in the region they serve, than the shipper can get via Liverpool. I asked for actual records of this saving, and the general traffic manager turned right to the books and gave me my choice of actual entries. Here is one, December 4, 1907, on cotton from Memphis, Tennessee, to the spinner at Oldham, England. Total expense via Liverpool 79.55 cents per 100 pounds, and via Manchester, 75.45 cents, a saving to the spinner of 4.10 cents or 91.84 cents per long ton. Another entry, December 21, 1907, shows a shipment of cottonseed-oil soap from Norfolk, Virginia, via New York to Manchester. The rate in cents per 100 pounds via Liverpool was 43.168, but via Manchester Canal 37.01. That was a saving of 6.158 cents per 100 pounds or $1.379 per long ton to the manufacturer at Manchester.




THE INCREASE OF HARBOR EARNINGS
The annual income of the Port of Manchester has steadily crept up to $2,500,000. The canal will probably pay a dividend this year

It may seem surprising that with these advantages put before a merchant, the port of Manchester does not at once take the lion's share of the port traffic from Liverpool. But there are reasons, one of which, when stated, will sound very familiar to American readers. There are associations in Great Britain, among transportation interests, called shipping rings. A Royal Commission has been investigating them. Mr. Langdon, the chairman of the Manchester Chamber of Commerce, testified before this commission a year ago, that there is a conference of Liverpool steamship lines, who give rebates to shippers at the end of each six months, provided such shipper has not in the meantime patronized any vessel owned outside of the ring, going to points served by ships owned by members of the conference. This rebate is large enough to make most of the shippers "be good."

Further, the cost of shipping goods at Manchester amounts to six shillings per ton—two shillings for cartage from warehouse to docks, and four shillings ship canal toll. The cost of sending these goods by rail to Liverpool and putting them on board ship is ten shillings three pence. The ships in the conference are compelled to charge the latter sum, whether the goods are shipped at Manchester or Liverpool. There is therefore no inducement for them to come to Manchester.

So for many reasons it has been a slow business to build up a port where there was no port before. When at first the ships owned and trading at Liverpool would not come to Manchester the merchants of the city built a line of ships of their own, and established services to America, Africa and South America. There are now seventy large steel steamships owned by the Manchester merchants plying from the home port.

The success of the canal is well recognized by the business men of the region. They will tell you of Chadwick and Taylor, paper manufacturers, who because of

the canal, save $1 a ton on paper stock from Norway, a snug item of $25,000 a year. And of Rylands & Sons, merchants in cotton goods, who have saved in freights, since the canal was opened, over $1,330,000. And the Manchester Coöperative Wholesale Society, with a turnover of business in 1907 of over $470,000,000, who write off each year a sum now about $200,000 as saved in freights because of the canal. And there are many such cases.

There are not two opinions about the success of the canal among the people of the region. The men of Manchester have won their case, but it has required the keenest and most courageous fighting. The traffic shows a regular and healthy growth. The annual income, which has crept steadily up to about $2,500,000, shows in its very regular increase a comfortable promise for the future. Viewed as a stock company merely it must be considered a success. It is carrying its load of interest, taxes, and upkeep, and laying by a sinking fund, and this year hopes to begin paying a dividend on common stock. This is the measure of success. The battle is won.

# The Awakened Church

## III.—THE CHURCH AND EDUCATION

BY

SHAILER MATHEWS

THE Church has always stood for education. Go across the United States and you will find few institutions of higher learning that were not founded by religious denominations. Even our great state universities will be found generally to have received their original impulse from a group of religious men who believed, however, that the state as well as the churches had obligations to fit men for the higher experiences of life. Did not Horace Bushnell help plan the University of California?

But we should not misunderstand this educational impulse of our forefathers. Colleges were established not primarily for the purpose of teaching denominational tenets. They were established to insure education to the children of the families of some denomination and make it certain that such education should be in an atmosphere sufficiently Christian to insure the morals and the religious life of the rising generation. In some cases it is, of course, true that these colleges gave some instruction in denominational tenets intended for those who were going into the ministry, but an examination of the old catalogues will show that, while the fundamentals of Christianity were taught, sectarianism was not a dominating or even a frequent element of the curriculum.

In the process of time these denominational schools have lost even the semblance of denominational instruction. They are denominational in the sense that they are the contribution which a given body of Christians is making to the cause of higher education. True, a distinction must here be made between colleges which are immediately susceptible to official control, like the Roman Catholic and certain Lutheran schools, and the mass of colleges in which denominational control is hardly more than formal. Thus, for example, such

*The preceding articles in this series are "The Church and Scholarship," in* THE WORLD TO-DAY *for January, and "The Church and Social Service," in the February issue.*

NOT long ago I mentioned the great unnecessary loss of life in our coal mines to a man who holds a responsible position in a large corporation. He replied: "Yes; but, after all, it's not so serious, because most of the men killed are ignorant foreigners who can be easily replaced." That this man is a kind husband and father and an honest man of business I have every reason to believe. It is not heart he lacks so much as imagination. If every one had the same lack, much of what I have here to say might as well be left unsaid. Mr. Robert Watchorn, a man at the opposite pole from this man, some months ago, in an article entitled "The Cost of Coal in Human Life," presented to Outlook readers a graphic picture of the extent of this unnecessary loss of life and its effect in sorrow and privation upon thousands of women and children—the widows and orphans of those miners who "can be easily replaced." Unless it be the man quoted above and his ilk, no one could have read Mr. Watchorn's article without asking himself, "Is nothing being done to remedy these inhuman conditions?" Something is being done, as it is my purpose here to show. The Federal Government has at last come to the rescue of the miners.

We have heard much of late of the conservation of our natural resources. By natural resources we commonly mean coal and iron, silver and gold, water and trees, and the like. That human life is not only a natural resource, but the fundamental resource without which all others would be useless, is not generally realized. To save natural resources without saving human lives is like feeding the horse and starving the man who drives him. To save coal and waste the lives of the men who mine it would be indeed an anomaly in modern civilization. Fortunately, it would be not only an anomaly but an impossibility. Just in proportion as we waste coal we waste the lives of the miners. Just in proportion as we save coal we save the lives of the men who mine it. In this great work the commercial economists and the humanitarians meet on common ground.

Poor Langham, with the prize fairly within his grasp, found that he lacked the courage to retain it. And so the next morning, instead of the pleasantly anticipated call from her accepted lover, the unfortunate Rose was shocked to receive a pessimistic letter announcing that the engagement had not survived the night. To the casual reader it would seem that such a man as Langham would be impossible. But that Amiel was just such a person his elaborate Journal fully reveals. And Professor Mark Pattison has given his testimony that Amiel was not alone in his experiences, for six months after the Journal was published he wrote, "I can vouch that there is in existence at least one other soul which has lived through the same struggles mental and moral as Amiel."

Among the very large number of persons who come upon the stage in the action of this very remarkable book several besides the Squire, Grey, and Langham may have been suggested by persons whom the author knew. But the prototypes of these three are the only ones which really enter, in a vital way, into the actual construction of the novel. "But who was the real Elsmere?" one naturally asks. Many attempts have been made to identify this good preacher or that worthy reformer with the famous character, much to the annoyance of the author, who really created Elsmere out of the influences already described. The real Elsmere would be obviously one whose religious views were molded by Mark Pattison and Thomas H. Green, and one who was profoundly interested in, if not influenced by, the strange self-distrust of Amiel. The real Elsmere would be also one whose religious convictions led inevitably to the desire to perform some practical service to mankind. Such an Elsmere exists in the person of Mrs. Ward herself, who is to-day regarded by the workers and associates of the Passmore Edwards Settlement, in Tavistock Place, London, with very much the same love and gratitude as Elsmere won from the people of Elgood Street. For this beneficent institution was a direct result of the novel, and owes its existence to Mrs. Ward's energetic and influential efforts.

# A SONG IN EXILE

BY

MARIE CONWAY OEMLER

Oh, they that leave their fathers' land, new friends and homes to find them,
They turn their faces to the sea, but leave their hearts behind them.
Their hearts lie buried in the fields, along the blackthorn hedges,
Beside the brooks where rushes cool crowd close about the edges.
They're rooted in the holy soil, the green soil, of the sireland.
Who turn their faces to the West must leave their hearts in Ireland.

The West is wide and rich and free, a grand land—but a cold land.
I hunger for the warmth of love that's found but in the old land.
I hunger for the linnet's song across the sunlit spaces,
I want the sights and sounds of home, the dear familiar faces.
At twilight how the heart stirs—when the angelus is calling,
And on the misty Irish fields the silver dew is falling!

Asthore machree! The sea's between, and foreign skies are o'er me,
But in the night I feel my heart throb in the land that bore me.
I feel it beating strong beneath the shamrocks and the mosses,
It clings about my people's bones beneath the Irish crosses.
It calls and calls across the sea, to come home to the sireland,
The haunted hills, the singing winds, the smiling skies of Ireland.

Almost 30,000 men have been killed in the coal mines of the United States since 1889. In the year 1906 alone almost 7,000 were killed and injured, of whom over 2,000 were killed. The next year almost 9,000 were killed and injured, of whom over 3,000 were killed. There have been as many violent deaths in our coal mines within the last six years as during the preceding eleven years. And this increase in deaths is by no means entirely accounted for by the ever greater number of men employed, as is shown by the following figures: In 1895 the number of men killed for each 1,000 employed was 2.67. In 1906 it had risen to 3.40. During the period 1890 to 1895 the number of men killed for each million tons of coal produced was 5.97. During the period 1901 to 1906 it was 6.04. Six corpses taken out of the earth with each million tons of coal! We are now killing yearly in our coal mines vastly more men than we were twenty years ago; we are killing more proportionately to the number employed, and we are killing more proportionately to the number of tons of coal extracted. Under the same lack of adequate safeguards this death rate is not only bound to increase, but it is bound to increase at a constantly accelerated pace as our mines become deeper, and hence more difficult and dangerous to operate.

As everything is relative, even these facts are not in themselves a necessary condemnation of American methods of coal-mining. We must compare them with the figures for the other great coal-producing countries of the world. The following figures give the number of men killed for each 1,000 employed for the five great coal-producing countries during the most recent five-year periods for which statistics are available: France, 0.91; Belgium, 1; Great Britain, 1.28; Prussia, 2.06; the United States, 3.39. For every man killed in European mines we kill three or four. This sanguinary world's record is made even less excusable by the fact that the natural conditions in the United States are more favorable for mining coal with the minimum of danger to the men employed than they are in any other country in the world. Finally, the death rate is constantly decreasing in these four countries, instead of increasing as in the United States. In Belgium, before the Government intervened for the protection of the miners and the coal beds, the number of men killed each year for each 1,000 employed was 3.2. In other words, Belgium's death rate was then almost as large as ours now is. And the same is true to almost the same extent of France, Great Britain, and Prussia. "Go thou and do likewise!" is the obvious challenge, written in letters of blood. America has at last accepted this challenge. As a tragic and fateful spur to urge our Government to immediate action came four explosions in our coal mines in the one month of December, 1907, which left behind them 700 dead, besides many more injured.

These facts and figures were gathered during 1907 by Dr. Joseph A. Holmes, Chief of the Technologic Branch of the

THE EXPLOSIVE CHAMBER DEMONSTRATING THAT COAL DUST IS AN EXPLOSIVE
Photograph taken fifteen seconds after explosion

Geological Survey, and his assistants, acting on the orders of James Garfield, the Secretary of the Interior. These data, emphasized by the mute evidence of the 700 dead, had the desired effect. In May, 1908, Congress authorized the establishment under the Technologic Branch of the Geological Survey of a station for the investigation of mine explosions. The following December this station was opened in Pittsburgh, Pennsylvania, in the midst of the greatest coal fields of the world. In July, 1908, Congress appropriated $150,000 for the starting of mine rescue work in connection with the station. Thus the work of alleviation was coupled with that of prevention. It would be cold comfort to the maimed miners or to the grieving families of the dead merely to know that the causes of mine explosions were being scientifically investigated by the Government. In order to secure the benefit of Europe's greater experience, Secretary Garfield, through the State Department, invited Great Britain, Germany, and Belgium to send to this country their leading experts on mine disasters to aid in the starting of this work.

During the month of August, 1908, the three experts came. They were Captain Desborough, Inspector of Explosives under the Home Office, Great Britain; Herr Meissner, the head of the Mine Service, Germany; and Mr. Victor Watteyne, Engineer-in-Chief of the Administration of Mines of Belgium. Each had been granted a two months' leave of absence by his Government in order to help our Government start this new work. In company with Dr. Holmes they visited the anthracite region and the station at Pittsburgh which was then being built, the bituminous fields of western Pennsylvania, and the coal-fields of Illinois, Wyoming, Colorado, Alabama, West Virginia, and Oklahoma. While on this tour of inspection they exhaustively discussed mining problems, not only with the operators and State inspectors whom they met, but with the miners themselves. Before they returned to their own countries they submitted to the Secretary of the Interior a report on the prevention of mine explosions, giving detailed recommendations based upon their investigations in this country. The following is a portion of this report: "To be effective, investigations for the benefit of mining must be continuous. The opening up of new mines, the deepening of old mines, the meeting with new conditions, the changing of explosives, and the inauguration of new processes and methods will call for continuous investigations, to be followed by continuous educational work.

"Our investigations and recommendations relate primarily to questions of safety in mining; but in this connection we have been greatly impressed with another closely associated phase of the industry, viz., the large and permanent loss of coal in mining operations in many portions of the United States. This is a serious, permanent, and National loss. [This waste is estimated as between 300,000,000 and 400,000,000 tons yearly.] It seems to be a natural outcome of the ease with which coal has been mined in the United States [the use of the past tense is significant] and the enormously rapid growth of the industry.

"The active competition among the operators and the constant resulting effort to produce cheaper coal has often naturally led to the mining of only that part of the coal which could be brought to the surface most easily and cheaply, leaving underground, in such condition as to be permanently lost, a considerable percentage of the total possible product. [It has been customary to leave about half a ton thus permanently buried for each ton taken out.] Certainly much of this loss can be prevented through the introduction of more efficient mining methods. . . .

"The cordial reception everywhere accorded us leads us to believe that these recommendations will be received by the operators and miners in the same spirit of good will as that in which they have been prepared. But the success of this movement for greater safety and efficiency will depend upon the hearty and patient cooperation of the operators and the miners working together for the accomplishment of this purpose."

Very briefly stated, these are some of the more important of the accompanying recommendations:

The United States Government should examine and test all explosives and should prohibit the more dangerous, permitting the use of such only as may be designated by the

MEMBERS OF THE GOVERNMENT RESCUE CORPS
AT THE OPENING OF THE EXPLOSIVE CHAMBER

Government "permissible explosives." [This already has been done, and last May the Government published a list of seventeen "permissible explosives."]

All explosives should be made into cartridges and placed in closed receptacles before being carried into the mine, and each miner should be limited to the amount he needs for the day.

The roadways in the mines should be kept as free as possible from loose coal which may be ground into dust. [Contrary to the previous opinion of many of our practical miners, coal dust is frequently the cause of explosions.]

In mines containing as much as two per cent of gas locked safety lamps only can be used without great danger.

Electricity can only under the most rigid safeguards be used without grave danger. It should be borne in mind that most insulating materials are soon destroyed underground, and that no live wires should be left exposed. [As Mr. Watchorn pointed out, the use of electricity insufficiently safeguarded has been one cause of the increased number of explosions of recent years.]

All new construction, shaft lining and superstructures, should be built, so far as is possible, of non-combustible materials.

Thorough discipline about the mines is absolutely essential, and it can be effected

only through the hearty co-operation of operators, miners, and the State.

Safety and efficiency would be greatly promoted through the establishment in the different coal regions of special schools for the training of fire bosses, mine foremen, superintendents, and inspectors.

Thus freely were the wisdom and experience of the Old World offered gratis to the New in its first attempt adequately to prevent the waste of lives and wealth in this great industry, the proper conduct of which is so essential to the present and future prosperity of the Nation. By order of President Roosevelt, this report was distributed among the coal mine operators and the million miners of this country.

In putting into effect the recommendations of our own mining experts and those of these European advisers, the Government has already established two Experiment Stations, the one already mentioned at Pittsburgh, and a sub-station at Urbana, Illinois, in connection with the University of Illinois. This station will cover the coal-fields of Illinois, Indiana, Michigan, Iowa, northern Missouri, and western Kentucky.

Government mining engineers thoroughly trained in the use of rescue apparatus are assigned to these stations. Besides constantly instructing miners and mine bosses in the use of the rescue apparatus, they are ready at a moment's notice to go to any disaster in their district. They are equipped with oxygen helmets, which make them look like the Martians of H. G. Wells's imagination. With these helmets they can enter a mine immediately after an explosion, no matter how full it may be of suffocating smoke and death-dealing gases. These helmets enable the wearer to breathe naturally for a continuous period of two to three hours. They are made up of tanks containing oxygen under high pressure, absorption cans for taking up the oxygen exhaled from the lungs, and a mouth attachment with breathing-bags. Training in their proper manipulation is essential for their successful use in rescue work. They must, too, be used by men accustomed to underground work, and who, through practice, have learned to have confidence in their efficiency. The trained men who use this apparatus are known as the Government Rescue Corps. In ordinary times they are teachers in its use. In times of disasters they are rescuers. When they find a man after an accident, they take him immediately outside, or to some place inside the mine where the air is breathable. There they revive him by administering oxygen and by exercising his body. Each corps carries a resuscitating cabinet, which consists of cylinders charged with oxygen, a flexible breathing-bag, a flexible tube, and a hood which fits over the mouth and nostrils of the patient.

Previously, after a disaster the miners who were not killed by the explosion frequently lived for many hours, until finally overcome by the poisonous gases. Meantime their friends above ground, although knowing they must be dying, were powerless to go to their rescue. Frequently the uninjured corpses of scores of men have been found when the ventilating apparatus had been finally started again so that the would-be rescuers could enter the mine. On the invitation of the Government, coal-mining companies send relays of picked men to these stations to be trained by the Government experts in the use of the oxygen helmets. It is not the intention of the Government permanently to carry on general rescue work, but simply to supervise rescue operations and to demonstrate the apparatus until the mining companies have thoroughly trained and equipped rescue corps of their own. Each station has air-tight rooms, simulating the conditions underground, where gas can be generated and the miners drilled in the use of the helmets.

In the few months that these rescue corps have been in existence they have visited a number of mines where explosions have occurred and others where there have been serious fires. They have saved almost half a score of lives. They would have saved more had it not been that at the only serious disaster they have attended—at the Marianna mine, in Pennsylvania, where more than 150 men were killed—the explosion was so unusually violent that all the entombed miners except one were torn limb from limb. This one man they found groping through the darkness. They hurried him to the surface and gave him the resuscitating oxygen treatment. He has recovered from his injuries, and is now, thanks to

the Rescue Corps, the sole survivor of this disaster. The Rescue Corps has done particularly notable work in stopping the spread of fires, and has thus indirectly saved many more lives. The Government officials have already received from the at first skeptical practical miners and mine operators many congratulations upon the great bravery and technical skill of the men of the Corps.

Besides the rescue work, these stations are engaged in testing explosives. They have exploded both literally and figuratively the costly fallacy that coal dust cannot cause explosions. The explosions represented in the accompanying illustrations were both caused by coal dust. These great explosive chambers, built to simulate the conditions in the subterranean galleries of a mine, were sprinkled with dry coal dust and then a charge, or "shot," was exploded, such as would ordinarily be used for blasting coal. The results were explosions which must have meant violent death to all concerned had the chambers been actual mine galleries filled with miners. In general, little or no care has been taken in removing or wetting down coal dust, as it was thought to be non-explosive except when combined with more than the usual amount of gas. Probably many of the worst disasters of the past have been caused by coal dust explosions.

These stations also serve as head quarters for engineers in the study of the conditions which result in waste of coal.

A MEMBER OF THE RESCUE CORPS

As mentioned before, the conditions which result in loss of life are often the same which cause waste of coal. For instance, if left to their own devices, miners are apt to use a dangerously large amount of explosive in a single "shot," in order to loosen a greater amount of coal and so facilitate the work of extraction. This loosens and weakens the props and increases the danger of roof-falls. Mine lamps are tested at the stations with respect to their safety in the presence of explosive combinations of coal, gas, and

MINERS BEING TRAINED TO USE THE RESCUE APPARATUS IN A ROOM CONSTRUCTED TO SIMULATE THE CONDITIONS UNDERGROUND

air. Reports of all mine accidents both in the United States and foreign countries are there collected. After each disaster mine experts are sent to study the conditions and find out, if possible, the cause of the accident. The data thus gathered are then tested by experiments in the artificial mine galleries and in a mine which is used as an experimental laboratory.

The Government is to establish other mine stations at or near the greater centers of accidents. There will probably be one at Raton, New Mexico, to cover the fields of New Mexico, Colorado, Utah, Wyoming, and Montana. There may be another at Salt Lake City, which will be the headquarters for the Utah fields and accessible to those of Montana and Washington. South McAlester, Oklahoma, has been selected as the probable site for a station to care for the fields of Oklahoma, Arkansas, and southwestern Missouri. Whether Knoxville, Tennessee, Birmingham, Alabama, or Lexington, Kentucky, would make the best location for the station to cover the fields of Alabama, Tennessee, Virginia, eastern Kentucky, Georgia, and southern West Virginia is still under discussion

The Government's object-lesson has already borne fruit. Four of the larger coal companies have established mine accident stations of their own. The Frick Coke Company, which employs 30,000 men, has the most complete of these private stations. Near Connellsville, Pennsylvania, it is within easy reach of all the Company's mines. The corps of six men has been trained in the use of rescue apparatus by the Government experts at the Pittsburgh station. The Consolidated Coal Companies of Maryland have opened a rescue station at the mine of the Fairmont Company, Fairmont, West Virginia. Inspired by the heroic and valuable work of the Federal Rescue Corps at the time of the terrific explosion in their Marianna mine, the Pittsburgh-Buffalo Coal Company has there established a station. Here, too, are six Government trained men equipped with the oxygen helmets. The fourth station is at the Zeigler mines

in Zeigler, Illinois. Here, again, are six helmeted rescuers, trained at the Government sub-station at Urbana, Illinois. When all or most of the great coal companies have followed the lead of these pioneers, the Government will retire from the rescue business, except, perhaps, in an advisory or supervisory capacity.

Dr. Joseph A. Holmes, who, as the Chief of the Technologic Branch of the Geological Survey, is the responsible head of all this work, believes that it cannot be adequately extended with coal at its present price. He says: "The price of coal in the United States is kept down by destructive competition to figures which permit the mining of only that coal which can be mined most cheaply, and the mining of that coal by the cheapest methods without due regard to the safety of the miner or any insurance for his family." Obviously, in Dr. Holmes's opinion, the co-operation between operators, miners, and the State, insisted upon by the European experts, is not alone sufficient to purge the Nation of this shameful waste of life and property. The American people must also co-operate—not only indirectly through their Government, but directly through their pocketbooks. They must pay whatever increase in the cost of fuel may be found necessary in order to safeguard the life of the miners and prevent the waste of resources the preservation of which is so essential to the Nation's welfare.

Furthermore, Dr. Holmes believes that this increased cost can be more than offset by the increased work we can derive from coal by improved methods of combustion. The combustion, as well as the extraction, of coal is one of the problems with which he is dealing as the head of the Technologic Branch of the Survey. Ordinarily, five to twelve per cent only of the coal burned in furnaces is converted into work. Government tests have already proved the possibility of increasing ten to fifteen per cent the efficiency of coal used under steam boilers. By using the power of coal indirectly as a gas producer each coal in a gas-producer plant develops two and one-half times its power when used in the ordinary steam-boiler plant. The practical application of these experiments has already saved the Government over $200,000 on its annual coal bill of approximately $10,000,000. Other experiments are proving that much the same increases in efficiency can be effected with residence-heating boilers. If one ton of coal henceforth can be made to do the work of two and one-half tons, even a doubled price would not be a serious grievance for the consumer. In such case the doubled price would mean a saving of money to the consumer, a saving of coal to the operator, a saving of life to the miner, and a saving of all three to the Nation.

In order that this work may be more adequately financed, more independently organized, wider in its scope, and hence more effective, it is essential that there should be a separate Bureau of Mines and Mining. Both the Republican and the Democratic party platforms of last year advocated such a bureau. It was urged by President Roosevelt in his special Message to Congress transmitting the report of the National Conservation Commission. A bill for the establishment of such a bureau under the Department of the Interior was passed by the House of Representatives in May, 1908, by an overwhelming majority. It was favorably reported by the Senate Committee on Mines and Mining, but failed to reach a vote in the Senate before the adjournment of the Sixtieth Congress. The subject will come up for consideration at the next long session. It is of vital importance that public interest in the measure should not in the meantime subside.

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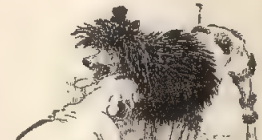

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# The New South America

## IV.—DEVELOPING RAILWAYS IN A UNIQUE CONTINENT

BY

PAUL S. REINSCH

PROFESSOR OF POLITICAL SCIENCE, UNIVERSITY OF WISCONSIN;
MEMBER OF THE PAN-AMERICAN COMMISSION

THE problems of railway construction and development in South America are far different from those which have been so triumphantly solved in our own country. As the nature of these problems is determined by the physical geography of the continent, it may be well to cast a glance at its natural features of mountain, river and plain. There is in South America no region to be compared in extent with those vast level plains between the Alleghenies and the Rocky Mountains, which constitute a very paradise for railway builders. The plains of Argentina, south and east of the mountains in the region of Cordova, do indeed exhibit the features of our western country; but being a strip of land 1,500 miles long and varying in width from 200 to 500 miles, the conformation of this level region differs greatly from the valley of the Mississippi. Other regions in which railways may be constructed with similar ease, as far as gradients are concerned, are situated in the tropics and therefore contain conditions, both climatic and cultural, which are unfavorable to railway construction on a large scale.

The most characteristic feature of the South American continent is the fact that its exceedingly high main mountain ranges skirt the west coast at a distance of from one to two hundred miles all the way from the Isthmus of Panama to the Strait of Magellan. The west slope of South America, instead of containing spacious territories like California and Oregon, is composed of steep slopes in which here and there open up short river valleys, fertile indeed in resources and often delightful in climate, but too small in extent to be the seat in themselves of important economic life. The mountain range acts as a barrier to render inaccessible the fertile region of the eastern slope, which, on account of its short distance from the Pacific, ought at first sight to have ready access to the ocean and to its communication advantages. At this writing, not one railway is as yet completed which connects the great river systems of the east slope with the Pacific coast. The construction of such railway lines is indeed projected and may be looked for in a comparatively short time, but the very fact that they have not been built, in itself indicates the difficulty of construction in that region.

From the point of view of communication, the most important characteristic of South America lies in its vast river systems, by which the interior of the continent is abundantly opened up and rendered accessible. The Orinoco on the north, the Amazon with its numerous affluents in northern Brazil, and the Parana-Paraguay system on the south, together with such lesser but yet important streams as the Magdalena in Colombia, the San Francisco in central Brazil and the Rio Negro in southern Argentina, constitute means of river communication which are equaled in no other continent. The Ori-

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noco is navigable for 1,000 miles. It has been computed that the Amazon River system contains 15,000 miles of streams commercially navigable.

The countries which are rendered accessible from the Atlantic, through the Amazon system, are Venezuela, Colombia, Ecuador, Peru and Bolivia. The size of the main stream of the Amazon is such that ocean-going steamers may ascend it for a distance of 2,000 miles, to the port of Iquitos, in Peru. Many of its affluents, like the Madeira or the Xingu, are navigable to ocean vessels for hundreds of miles. Through the Parana system, Bolivia, Paraguay, southern Brazil, Argentina and Uruguay acquire an outlet to the sea. These rivers are often used for communication between points comparatively near to each other, though the actual journey by ocean and river route may be thousands of miles. Thus the ordinary means of communication between Lima and Iquitos, in Peru, is by way of the Strait of Magellan and the Amazon, a distance of 10,000 miles, while by direct route the two cities are separated by only 500 miles. Similarly, communication between Rio de Janeiro and the region along the upper Parana requires a voyage of 3,000 miles, while the direct distance is but one-seventh of that figure.

These facts indicate the first and most elementary use made of railways in a tropical region rich in river communication, namely, to act as connecting links between river and ocean and between different river systems. The river still retains its primary importance as a highway of commerce. Only where thousands of miles can be saved by the construction of a railway is such an intermediary link inserted. Many such short connecting lines exist in Brazil and in other tropical South American countries.

The most important railway system in South America is that of the Argentine Republic, comprising in its present extent 14,000 miles, extending 700 miles across the plains to the slopes of the Andes, and a thousand miles to the north to the boundaries of Bolivia. The system is connected with that of Uruguay and will soon receive connections through Uruguay with railways in southern Brazil. In the southernmost part of Argentina, railway development has as yet not advanced, but as the population increases and lands are taken up in this region, the net which now surrounds Buenos Ayres will gradually be extended farther south. The region between Bahia Blanca, Buenos Ayres, Rosaria, Cordova and Tucuman contains many lines and branches, forming a railway net not unlike that in many parts of the United States. The railway systems of Brazil, comprising a total of 12,000 miles, are still mutually isolated, every important Atlantic port having its feeders, which bring down the products from the interior. The most extensive system of railways exists in the state of Rio de Janeiro and Sao Paulo. Other railways subserve the purpose of connecting river systems or acting as links between the ocean and interior river ports.

Railway building in the Andes is a task of great difficulty and expense. The slow development of the rich resources of Peru and Colombia is due principally to the heavy expense of transportation and the great cost of railway construction. The Oroyo railway in Peru is perhaps the most expensive in the world. Built by that most imaginative of engineers, the American Meiggs, who shunned no difficulties in following out a brilliant idea, it contains in its traject of 150 miles the greatest engineering difficulties to be encountered anywhere. The railway was built when Peru was still rich, or felt itself so, when public money was spent with lavishness and little thought of the morrow. Modern engineers criticize the route of the railway, which painfully works its way up through the terrific gorges of the Rimac as the river descends from an altitude of 13,000 feet to the sea. The modern critics maintain that it would have been far simpler and less expensive to abandon the river ravine and to construct the railway up along the mountain slopes entirely away from water courses. The proprietors of the Cerro de Pasco mines, who make use of the Oroyo railway for transportation purposes, have already considered the advisability of constructing their own line from the mountains to the ocean along a more feasible route. Though the transportation charges on this railway are necessarily high, it is not even yet a paying venture, as far as up-keep and running expenses are concerned.

North Americans, when thinking of railway construction in the southern continent, are of course primarily interested in that great plan for a Pan-American railway, connecting all the countries of the two continents. When this plan was first advanced by Secretary Blaine, the difficulties to be overcome were little realized by its sponsors. Men more familiar with the local geography repudiated or ridiculed the scheme as an impossible Utopia. Yet the first Pan-American Conference in Washington created a commission, under whose auspices there was made a careful survey of the route which such an intercontinental railway might take. The idea thus received a more definite form, and, though apparently so chimerical in the beginning, it has become one of the principal elements and forces in railway construction in Latin America.

The surveys made by order of the first commission were reported to the Conference of Mexico, in 1882, which instituted a new commission, composed of Henry G. Davis, of West Virginia, Andrew Carnegie and three representatives of Latin-American states. This committee and its representative, Mr. Charles N. Pepper, have continued to hold up before the governments and capitalists of the countries concerned, the plan of this great undertaking, the feasibility of which has received the endorsement of such technical and financial experts as President Cassatt and Mr. Thomas F. Ryan.

The surveys and studies of the Pan-American railway commission have, as a matter of fact, been made the basis of plans for railway construction in the Central American states, in Colombia, Ecuador, Peru and Bolivia. Nor are the other great states, like Brazil, Argentina and Chile, unaffected by these proposals. The total distance from New York to Buenos Ayres by rail would be 10,400 miles. From the north, communication is now established as far as the boundary of Guatemala. From the south, the Argentinian railways extend to the very boundaries of Bolivia. In the space between the southern boundary of Bolivia and the northern boundary of Guatemala, the construction of sufficient railway mileage has been completed, or is definitely provided for, so that at the present time the portion of the intermediate railroad not thus specifically assured is about 3,600 miles. The idea of a Pan-American railway has been especially influential in the construction plans of Peru and Bolivia.

The difficulties and disadvantages of so vast an undertaking are enhanced by the fact that in South America the trunk line would take a north-southerly direction, whereas the currents of commerce in that continent are quite generally from east to west or vice versa. What is needed primarily is connection of the Pacific ports with the interior region and especially with the plains beyond the Andes. The Pan-American railway in taking a direction at right angles to these natural currents of commerce is thus prevented from taking advantage of the latter to an extent sufficient to render its immediate construction profitable. The other difficulty lies in the nature of the territory to be traversed by the railway. As planned, it is to follow along the highlands of the Andes. In this region not only do engineering difficulties appear in their extremest form, but there is also a lack of large centers of population and industry such as would render local traffic profitable. The only alternative, however, would be to build the railway on the eastern slope through the tropical forests of the headwaters of the Orinoco, Amazon and Madeira Rivers. The conformation of the country would indeed render construction far easier, but in these regions civilization is so little advanced that the building of a railway several thousand miles in length is at the present time entirely out of the question. In the mountains the mining industry may be counted upon to furnish a certain amount of business. The capitalists interested in the development of these mines will also give their support to railway construction. No one would at present give active support to a road planned to traverse the tropical jungles of eastern Ecuador and Peru.

Over against these formidable difficulties may be set certain very great advantages which the construction of a longitudinal railway would immediately bring to the countries concerned. In the Central American states, its existence would be the greatest possible factor in civilizing and pacifying this turbulent region. The creation of a more closely-knit fed-

eral union would become possible only through the establishment of such means of communication. In Colombia and Peru a longitudinal railway would be of great assistance in establishing settled political relations, and in opening up and rendering accessible all the great mineral wealth contained in these favored territories. The Pan-American railway would serve as a backbone to the various lines connecting the inland with the sea and taking a west-easterly direction. The railway would thus not be dependent entirely upon the traffic in the mountains, but would become a link of communication between all the valleys tapped by coast railways. What railroads have done in establishing the political stability and economic welfare of Mexico they will do in turn for Colombia and Peru.

With these general facts and matters in mind, it may be interesting to review briefly the railway progress thus far made in the principal countries of South America. The up-keep of a railway in a tropical country is a matter of great difficulty. The roadway is attacked by torrential rains that sweep away even the most solid embankments. Machinery and rolling stock degenerate very rapidly under the influence of a moist and hot climate. Anyone familiar with the southern Mexican lines under the old régime, before the Tehuantepec railway was put in condition, will remember the ricketiness of the roadbed and the numberless broken-down engines and cars lying by the wayside. The railways of northern Brazil make a similar impression. The climatic difficulties are so great, the cost of operation so excessive, that these railroads are in a very backward condition indeed, nor are the mountain railways of the west slope to be compared with systems in the United States and Europe. The rolling stock is cheap and poorly preserved, the roadbed defective. The labor material which railway managers can count upon in these regions is not intelligent enough to make the successful operation of a modern railway system possible.

The systems in the region of Rio de Janeiro and in southern Brazil have, however, reached a far higher stage of perfection. Time-tables are accurately observed, the railway material is more adequate, and the roadbed more even and satisfactory. The Brazilian railways are owned and operated largely by British, French and German companies. There are also some Canadian concessionaires. The Argentinian railways, the majority of which are also owned and operated by European companies, enjoy relatively far more favorable natural conditions, and thus may well be compared in efficiency of service and comfort with the average railways of North America and Europe. As great distances are here traversed by rail, such comforts as sleeping and parlor cars are commonly provided. The speed of the trains is satisfactory, and the operation careful in the avoidance of accidents.

The railway problems of Chile are very peculiar, on account of the fact that Chile has a territory of great length but very narrow width. Chile desires a longitudinal railway in order that all the parts of the country may be closely knit together, in a manner more effective than can be accomplished by mere communication by sea. The Chilian railways, largely owned and operated by the government, already extend for 800 miles from Puerto Montt in the south to Serena in the north, and the completion of the railway to the northernmost part of the country is only a question of a comparatively short time. Means are not lacking, as the rich resources of the nitrate region of the north amply permit the construction of a railway connecting Iquique with Santiago. The great transcontinental railway connecting Valparaiso with Buenos Ayres is all but completed at the present time. Only about 5,000 feet of tunneling remains to be done before rails will unite the Atlantic and Pacific in this part of the world.

Even at the present time, the trip from Buenos Ayres to Valparaiso may be taken from the morning of one day to the night of the next. It includes a day and night journey across the level plains of Argentina to the old colonial town of Mendoza, which, with its vineyards and olive orchards, lies directly under the eaves of the Andean mountain giants. Then, starting with an early sunrise, we are carried upward and upward on a narrow-gauge railway through some of the most imposing scenery the world possesses. At present, while the tunnel is not yet finished, a four hours' ride or drive is taken across

A BRIDGE AT RIO BLANCO ON THE TRANSANDINE RAILWAY

the summit of the pass up a steep ascent and down with breakneck speed along the sharp zigzags of the precipitously descending mountain road. The sight of the caravan of mountain coaches tumbling down this sharp incline, while herds of mules and squadrons of horsemen are literally sliding down from lap to lap in order to cut the distance still shorter, is one of the most picturesque things to be seen anywhere at the present time. All this will soon pass away when the tunnelmakers have burrowed their way completely through the mountain, and the traveler will pass a few thousand feet below the pass in ignorance of all its beauty and former interest

Railway development in Bolivia is of special importance to us because, while in the countries before mentioned European capital has been expended, Bolivia has turned to American capitalists and

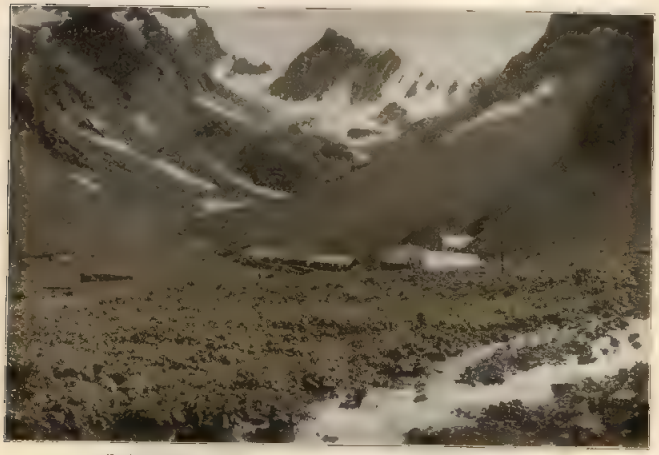
invited them to develop its railways. Through the sale of its claim to the Acre territory to Brazil, Bolivia came into possession of $10,000,000; in addition, some American capitalists have furnished about $17,000,000. All of this money is now being employed in constructing a railway line which will be a main link in the Pan-American and a continuation of the Argentinian system to the north. The banking-house of Speyer, the City Bank of New York, and the firm of W. R. Grace & Co. are the chief participants in Bolivian railway development.

The railway connecting Bolivia with Antofagasta, in Chile, which was constructed by an English syndicate, has now also been acquired by American interests. This railway runs directly from the ocean to the highlands of Bolivia and to La Paz. It is now possible to take a railway journey from Antofagasta on a very narrow-gauge railway across the Andes to the plateau of La Paz, and then passing across Lake Titicaca, descend again by rail from Puno to Mollendo, a Peruvian port. The connection with the Argentinian system will also soon be established.

A most interesting railway is being constructed in the interior of the continent. All the important rivers of Bolivia, with exception of the Pilcomayo, empty into the Madeira, the main affluent of the Amazon. But the falls of the Madeira are so high and extensive as to impede navigation. Decades ago, two American engineers, the brothers Clark, planned a railway by which the falls were to be flanked, and commerce between Bolivia and the Amazon region rendered possible. The railway concession has a long and checkered history, but as a part of the Acre claims between Brazil and Bolivia, the Brazilian government has finally engaged itself to have this railway constructed, in order that the Bolivian river system may have a commercial outlet. The concession for this railway on the west boundary of Brazil has just been awarded to a Canadian syndicate. Interest guaranties are sufficient, so that the work will be immediately commenced and rapidly carried to a finish.

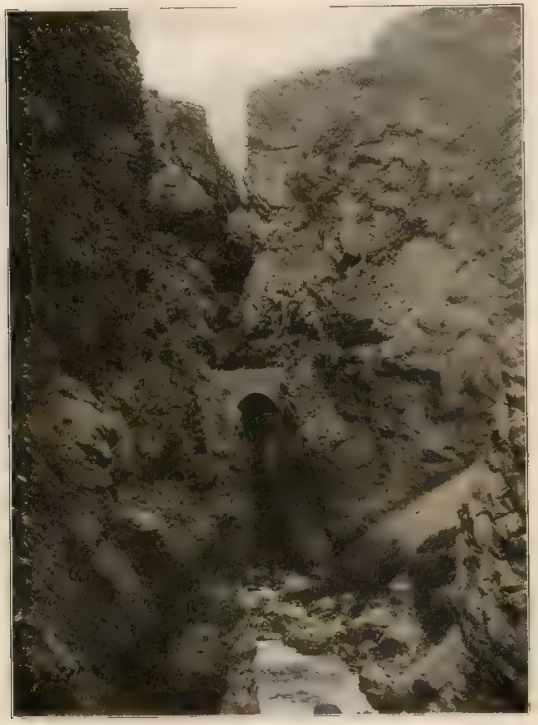
THE STATION AT RIO BLANCO
On the Transandine Railway

The railways of Peru are largely under the control of the Peruvian Corporation, the company of foreign bondholders which in 1890 adjusted the debts and



THE HIGHEST STATION ON THE BUENOS AYRES-PACIFIC RAILWAY
Near the Chilean boundary

A VALLEY IN THE ANDES
On the Buenos Ayres-Pacific Railway



A WILD CANYON IN THE ANDES

The Salto del Soldado, or Soldier's Leap, bridge on the Transandine Railway

finances of Peru by taking over state railways and other public properties. The present administration of Peru, under President Leguia, is making special efforts to have the Peruvian railways extended, and particularly to advance the construction of the trunk line which will be a part of the Pan-American railway. In this way, the Pan-American will be carried farther north by a few hundred miles from the Bolivian boundary. Already portions of this line have been built, especially the railway from Lake Titicaca to the old Inca capital, Cuzco, in the Andean highlands. The line is to be continued farther north until it joins that which extends to the south from Cerro de Pasco and Oroya.

The situation in Peru illustrates perfectly the difficulties as well as the advantages of the Pan-American railway. Nowhere are obstacles to construction

more formidable; nowhere will building and operation be more expensive and yet, notwithstanding all this, an analysis of the economic and political situation of the country must cause us to look upon the completion of this project as inevitable The uniting of the different provinces of the republic by railways is a primary political need, nor can the economic life of the country be developed except in a measure as these railway plans are carried out. Among the railways projected and in course of construction in Peru, are two lines connecting the coast with the east slope of the Amazon River system. The Oroya line is to be extended to the Ucnyali River, while Payta and Piura, in the northernmost province, are to be connected with the Marañon, the westernmost affluent of the Amazon, which has its source within a distance of one hundred miles from the Pacific coast.

The greatest difficulties in the construction of the Pan-American railway are anticipated in Ecuador, and even to a greater extent in Colombia. Ecuador has just completed the construction of the railway from Guayaquil, on the Pacific, to Quito, the capital, situated in the highlands at an altitude of 9,300 feet. The greater portion of this road may be utilized as a link in the Pan-American chain. Yet, greater difficulties than those already overcome still remain in Ecuador; and when we come to Colombia it must be confessed that scarcely has a beginning been made toward solving the problem of the Pan-American by actual construction. The plans in their present state contemplate the building of a railway from the Gulf of Darien, and more specifically the Gulf of Uraba, southward up the valley of the Cauca River through the fertile and rich territory of Antioquoia, in which live the most sturdy and industrious among the Colombian population. It is a strange paradox that Colombia, lying at the very flank of the Panama Canal, has thus far almost entirely escaped the attention of capitalists and men intent upon industrial develop-

AN AVALANCHE SHED

ment. Rich in natural beauty and in mining and agricultural resources, this favored country promises to become a great field for development after once it has been opened up to a certain extent by railways.

The fact that Bogota lies considerably to the east of the Cauca valley, and that it is being connected with the Magdalena River by a railway, would make the further extension of a railway system in that direction not improbable. It is therefore possible that, at not too great a distance of time, construction may continue for some distance along the alternative route of the Pan American, which, cutting the various affluents of the Orinoco and Amazon at right angles, and avoiding the highlands, makes its way along the lower plateau amid lands suitable for tropical agriculture. When once the development of this region is undertaken in earnest, such movements, now apparently far away, may be executed with surprising rapidity.

In the Central American states the idea and route of the Pan-American railway is likewise a most important factor in the making of railway construction plans. Doing the most necessary things first, these countries have connected their Atlantic and Pacific ports with the inland. But they are now feeling the need of a transverse railway connecting the five republics with each other and with Mexico, and moreover forming a link between their little railway systems from port to port. The political consequences of the construction of the transverse railway in these parts have already been indicated. Economically, too, a railway of this kind would pay, and its returns would probably be at the beginning more abundant than those of some of the South American railways. The fact that there would be created a direct connection between the United States and the Republic of Panama would induce a great amount of passenger traffic. The natural beauties of the Central American countries would attract tourists in streams, and the investment of American capital would be extended from Mexico to the southern countries, so that a new era would arise for these small republics.

It is thus apparent that while great

THE ARRIVAL OF THE FIRST TRAIN AT QUITO

Quito, the capital of Ecuador, is 9,500 feet above the sea. The first train came from Guayaquil, on the coast, June 11, 1908

CUEVAS VALLEY, ON THE ARGENTINE SIDE
Where the train enters the summit tunnel

labors and sacrifices still separate us from the complete fruition of the bold plan of Secretary Blaine, yet the things already accomplished are sufficient to vindicate the power of his conception in the development of the two continents. The idea exists, a living force. It has modified and is modifying the action of men in planning communication systems. With every new fifty miles of main line constructed, it establishes itself more completely, becoming thus a new incentive to further effort and success.

While American capital has participated but little in the railway construction in Brazil, Argentina and Chile, it now has the primacy of interest in the northwest region of South America. American capitalists have awakened to the opportunities that here await them; and even during the next decade we may look forward to the investment of much American capital and to the sale of great amounts of American-made railway materials in these regions where railway development is comparatively new and beset with great difficulties, but promises in the end unusual returns.

# A STREET OF A THOUSAND MILES

BY

ALEXANDER HUME FORD

HERE is a thickly populated American boulevard that extends a thousand miles north and south in an almost straight line. It is the longest street in the world. I have covered its length from end to end, and know whereof I speak.

It began with a wager. I undertook to walk the length of Broadway in a day. The wager was made at night and early in the morning I started out to follow The Great White Way to its end where the houses ceased to be. Weeks later, I was near the mouth of the St. Lawrence, still on The Great White Way in a well-populated street that, beginning at the Battery, runs northward for five hundred miles, a thickly settled street for almost that entire distance, and one on which the few uninhabited gaps are rapidly closing, and along which the trolley is making its way to the uttermost end.

I started to walk! Nearly dead with fatigue, I pushed forward in an automobile and finally completed my journey on an electric tram — lost my wager of course, but won an unbounding appreciation for the greatest street in the world; so much so in fact, that I determined to start afresh from the present northern terminus of Broadway and follow this wonderful street to its southern end, even if it landed me in the Gulf Stream, which it did.

I had always believed that our great American Broadway began at the Battery and ended at the Harlem River. It doesn't — it begins on the north bank of the St. Lawrence and runs many hundred miles along the river side toward Montreal; but near the metropolis of French Canada, the great American street crosses the river and, at Sorrel, turns southward by the banks of the Richelieu River, along either side of which stream (virtually a great dividing gutter) its houses face each other, and so the street goes on and on until it crosses the international boundary line and passes into the United States. But for Lake Champlain, this city street, that starts far to the eastward of Quebec, might extend uninterruptedly southward to the other end.

Already cities and villages along the lake on both sides are being connected by the interurban trolley, while southward to Troy a city street has already extended its way, and Troy merges into Albany, from whence the trolley line along the banks of the Hudson is rapidly extending the great interurban street that is connecting every city between Albany and Manhattan. From Tarrytown southward the gaps are all closed and Broadway passing through the great metropolis from end to end, dives beneath the North River, runs without a break through Jersey City, Bayonne, along the northwest shore of Staten Island, through Elizabeth and on to Rahway, Bound Brook and New Brunswick.

A recently constructed trolley line is making a street of what was lately a highway, and near Trenton the thickly populated portion of the great boulevard once more begins and does not stop until it crosses the river, runs through many Pennsylvania towns, including Philadelphia, cuts the little State of Delaware in two and halts at Delaware City on the banks of the Delaware and Chesapeake Canal.

I traveled leisurely by land and water from the mouth of the St. Lawrence to this point, always in the great roadway, and along both waterway and trolley line found a continuous city street extending most of the way, while the end was not yet.

From Delaware City, the great Delaware and Chesapeake Ship Canal is to be

## The Religious World

**The Emanuel Movement**

The spread of interest in psychotherapeutics is very rapid. All over the country clergymen are undertaking the work. In some cases their energies are intelligently exerted, in other cases their zeal is born of a desperate determination to find something that will interest the people in the Church. It is natural that there should be opposition to the movement. Even in Boston the physicians are warning the people against too enthusiastic devotion to the subject, and particularly warn clergymen against the use of hypnotism. So prominent a preacher as Dr. George A. Gordon, in connection with the movement, has judged it necessary to preach on the dangers of being led into anything like fanaticism. All of which warning is necessary, but it is not clear that it is more than a call to caution. Psychotherapeutics can not be practiced safely by those who have no special knowledge of that which psychological suggestion involves, but the Church may well become a spring of health-breeding optimism if only the optimism be rational.

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**Trinity Church, New York City**

For the first time during its life of two centuries the corporation of Trinity Church has made a public statement as to its property. It was none too soon. No small amount of criticism has been passed upon the corporation for the character of the property which it rents to poor people. The total amount of property this report shows to be $14,079,330.49, with liabilities of $886,768.55 — mostly incurred in building operations. The receipts for the year ending July 31 were $779,775.94, with expenditures of $791,741.86. These expenditures, with the exception of about $100,000 for office and maintenance expense, and approximately $130,000 for taxes, water rates, etc., were in the interest of churches and chapels. We are glad to note that this report denies that liquor is sold on any of its property except in two cases where the property is under ground leases made over thirty-five years ago and not under its control, and also in a club which is in a large office building owned by the corporation. As regards the condition of some property under its control, the corporation states that it is true that it owns a number of small houses, but tenants prefer to live in them even as they are than in ordinary tenements. This report is satisfactory as far as it goes, but to the outside observer it seems that the Trinity corporation has too little regard for the welfare of the community. It has just sold a little park belonging to St. John's Chapel in Lower New York to the New York Central Railroad for a freight yard, and now proposes to abandon the chapel.

**The Religious Education Association**

From February 9-11 the Religious Education Association will hold its annual convention at Chicago. The series of meetings promise to be if possible of even more importance than those of preceding conventions of this influential association. The central topic will be religious education and social service. The program is remarkable in that it brings together such leaders in education as Presidents Eliot, Thwing, King, MacLean, Northrop, Mitchell, Strong, as well as such other persons of influence as Ambassador Brice, Henry F. Pritchett, Bishop Lawrence and Jane Addams.

**Denominational Union in Canada**

A basis of union between the Presbyterian, Methodist and Congregational denominations in Canada has been finally completed by the joint committee which for five years past has been working on the problem. It believes "the organic union of the negotiating churches is practicable." Even the most difficult matter for adjustment — the invested funds of the three churches — has been satisfactorily arranged, with due regard to the desires of the donors and yet in accord with the absolute organic unity on which the whole basis is planned. For final acceptance by the churches concerned, the proposed method of union is to await simultaneous action in 1910, as the Methodist General Conference does not meet until then. This delay is considered wise, as it will permit full and free discussion by all interested, there being no desire to hasten unduly the issue in any way.

From Stereograph, Copyright by Underwood & Underwood

THE HEART OF THE THOUSAND-MILE STREET

Broadway, New York, is the center of an artery of trade and life that extends from Quebec to North Carolina

ONE OF THE CANADIAN VILLAGES ON THE INTERNATIONAL HIGHWAY

dug, and the street will be extended to a point not forty miles from Baltimore, where the day summer resorts of the Maryland metropolis begin to dot the shores of the Bay and extend its pleasure boulevard northward. Southward a trolley line is being completed between Baltimore and Washington. Another has long been in operation from Washington to Laurel, halfway between the two cities, building up a village street so that the two great cities are already practically linked by an interurban streetway. The real estate speculators have laid out town lots for the entire distance between the National Capital and Baltimore; the trolley line will do the rest. Broadway has reached the Capitol, and moves onward.

From Washington to Mount Vernon there is a city street. From the Potomac, the Goulds are building a trolley line southward to Richmond, where their electric line from Petersburg northward, ends, and this is one direction Broadway is taking southward, but there is another.

Every New Yorker is familiar with the continuous street that runs from Sandy Hook — one might also say from Elizabeth or Tarrytown via New York city, for that fact — to Asbury Park, Belmar, and Barnegat Bay, a street that so soon as the ever-advancing trolley is pushed forward another lap, will extend on to Atlantic City and Cape May. In fact, there is a gap of but a few miles in the Great Jersey Broadway that runs in an almost unbroken line from the northern extreme of New Jersey on the Hudson, to its most southern tip at Cape May.

This Jersey street, now tapped by and become a part of the great international street, is interrupted only when it reaches Delaware Bay. It begins again, however, at Lewis, in Delaware, on the other side of the ferry, and stretches down the coast to, in time, meet the main street of Ocean City, Maryland, which is stretching northward to the Delaware line, as well as southward to Virginia, for the Old Dominion shares with Maryland and Delaware the peninsula formed by Delaware and Chesapeake Bays. The railway attempts

to carry a suburban street midway through the peninsula county—Accomac—and scores of steamers from Baltimore make the little towns on the railway at the headwaters of the various inlets and Sounds from the ocean, I was astonished to observe that a fisherman's village extends its main street along almost the entire strip of sand opposite the North Carolina coast.

THE OLDEST PART OF THE GREAT STREET
Its picturesque entrance to the city of Quebec

navigable streams their terminals, so that both railway and water transportation vie to create a suburban street from the Maryland line southward to Cape Charles, which is just opposite Norfolk and Old Point Comfort.

Latterly, Norfolk enterprise has begun to send a summer resort street southward from Cape Henry to the North Carolina state line, and driving along the "Banks" that separate Albemarle and Pamlico

There is talk of a railway or trolley down these banks, and when it comes, it will carry with it an unbroken street, hundreds of miles in length. The greatest fishing and hunting grounds in America will then be brought within hailing distance of a market, and the healthy sands once made accessible to southerners in summer and northerners in winter, will soon be lined along both ocean and sound front with a continuous and unbroken

row of cottages. Moreover, it is the intention of the government to extend a twelve-foot inland channel from Trenton, New Jersey, to Wilmington, North Carolina. It will pass through these sounds, so that from beyond Quebec to Wilmington, more than a thousand miles, some of us may

THE BASILICA OF ST. ANNE DE BEAUPRE

Populous Broadway begins in the spacious plaza of this old church, twenty-odd miles above the city of Quebec, and ends a thousand miles away

yet live to travel by launch or dash by motor car along a crowded thoroughfare, the longest street the world is likely to know.

It did not puzzle me as to why the early settlers of French Canada began the great one-thousand-mile street as near the mouth of the St. Lawrence as they possibly could. It was nearest "home." It was the French who, more than three hundred years ago, drove the Indians from the great river roadway and usurped their places. The fear that these very Indians might return kept the Canadians close together. Moreover the sturdy farmers from Normandy and Britany who first came over were accustomed to the social life in the little communes of France, and gladly furthered any plan that looked toward a continuation of the old life in the new world.

Naturally, too, the most valuable land was along the great highway of traffic, the St. Lawrence. The priests came with the colonists and carved out parishes along the river front, every nine miles a parish church, so that none might be too far away from a place of worship. Each new settler was allowed a very few hundred feet of water-front to his farm, that might extend back for miles into the country. The parish street grew up in a straight line from church to church, and along this, the farmers of "habitats" built their homes. There are no high buildings in this French Canadian street, save the churches, and the people speak a language that is the strange obsolete French of the time of Louis XIV.

Populous Broadway begins twenty-odd miles above the city of Quebec in the spacious plaza of the Basilica of St. Anne de Beaupre. Night and day, year in and year out, St. Anne, patron saint of the Bretons and Heavenly Queen of Canada, looks down the interminable international boulevard, from her gilded throne.

From St. Anne de Beaupre to and beyond Quebec there is an almost solidly built single street, the oldest part of the great international highway. Upon this part of upper Broadway there are few who understand even ten words of English. All along the streetway that follows the bank of the lower St. Lawrence it is the same. Even at Sorrel, where the great French street turns southward, there are not forty English souls to save at the Anglican cathedral, that is going to rack and ruin for want of a congregation to keep it in repair.

From that part of the great international boulevard between Sorrel in French Canada, and Plattsburg in New York state, thousands upon thousands of children annually march southward to work in the factories of New England.

A great American sewing machine company, however, that is putting up the highest building on Broadway, in lower

PART OF THE STREET BETWEEN ALBANY AND POUGHKEEPSIE

New York, is also erecting here on the greater Broadway, just beyond the international line in Canada, the largest factory in the world. Ten thousand denizens of upper Broadway, in Canada, will be drawn upon as hands, and perhaps the

ALONG THE HUDSON NEAR POUGHKEEPSIE

THE HISTORICAL HIGHWAY THROUGH PRINCETON

Nassau Street was a busy thoroughfare even in Revolutionary times and is still the direct route from New York to Philadelphia

THE ROAD FROM DELAWARE CITY TO BALTIMORE

little French children will cease for a while to flow down The Great White Way. Even to this day, however, the French tongue is still struggling for supremacy in upper Vermont, with more hope of vitality than a few hundred miles farther down on Broadway.

Broadway is sparsely populated along the New York bank of Lake Champlain, for a street, but there are cities, towns and villages here and there along the route, and that great modern builder of the suburban street — the trolley-line — is extending northward from Lake George, along the banks of which a continuous village is springing up.

From Lake George, the trolley that pushes through Glen's Falls and Saratoga to Albany is creating suburban streets in every direction along its line. The canal from Whitehall, at the southern extreme of Champlain, to Troy and Albany, carries the beginning of a great suburban street along its banks, and when this waterway is deepened, more factory towns are to be planted along its length.

But whether the great street is extended to the Hudson by either trolley or canal, it is bound to come, and that before long. From Glen's Falls, in fact, or even Lake George, along the trolley and canal, a continuous street may even now be said to exist, and every year sees more of its vacant lots covered with suburban or summer residences. Trolley lines and river lines compete between Troy and Albany, now almost one city. The trolley line southward from Albany to Hudson on the Hudson, is carrying a suburban street from the state capital, fifty miles down the river, while the electric lines from Poughkeepsie, ever extending northward, promise soon to make the upper banks of the river between that city and Hudson its suburban thoroughfare.

SIGNS OF THE SOUTH BEGIN TO APPEAR ON THE ROAD THROUGH MARYLAND

From Poughkeepsie southward to Newberg and West Point the continuous street is rapidly becoming a matter of fact, while from West Point to New York city, on both sides of the river, the land is in the hands of the army of real estate boomers, who promise not a single avenue, but many parallel streets, served by rapid trains, boats, and trolley cars. From Nyack and Tarrytown on either side of the river, the great street knows no break for an almost indefinite stretch.

At Elizabeth the great American street debouches; one thickly populated avenue turns inland along the trolley and canal to Princeton, Philadelphia, and Wilmington, the great trade route; the other, the

NEAR THE SOUTHERN END OF THE THOUSAND-MILE STREET
The old-fashioned town of Beaufort, North Carolina

great pleasure boulevard, follows the Jersey sea coast, through city, town and seaside resort, more than a hundred miles without a break. Trolley, locomotive and steamboats contest for the traffic along this boulevard from Newark to Long Branch. The steamboat along the inland passage must, here, drop out of the race,

VIRGINIA BEACH, A LINK IN THE GREAT BOULEVARD

but the trolley car bounds on through a continuous street to Ocean Grove and Belmar, with the intent of eventually reaching Atlantic City and Cape May.

The railway, at present, turns aside at Seaside Park, and seeks to carry the great American street across to the mainland of Barnegat Pier, near Tom's River, but even the railway turns again to the beach, scarcely more than a score of miles farther south, and sends its rails in both directions along the coast to tap the traffic of the great main street. A few miles yet to be built along the sandy beach, a trestle across New Inlet, and Atlantic City will send its hundred thousand dwellers in cottages to spread themselves along the northern boulevard. Already they have pushed their main street southward to Cape May, where both locomotive and steamboat from Philadelphia and Delaware Bay cities tap the southern tip of the street that begins beyond Quebec.

Ponderous ferry-boats capable of carrying entire loaded trains at one crossing, bridge the distance between Cape May and Cape Henlopen, so that the endless street once more wends its way onward through the town of Lewis and on to the Delaware Breakwater, the pleasure boulevard of the Baltimorians in the summer.

The "street" through the tip of Virginia is likely longest to remain the country lane in the great through boulevard, yet at the end of this country lane the first permanent English-speaking settlers of the New World landed in 1607. There is a ferry service now between this tip of Virginia, over on the Maryland side, and Old Point Comfort, Newport News and Norfolk. A few years ago, Old Point was all but isolated; to-day the trolley has brought a solidly built-up street from beyond Newport News to the very gates of Fortress Monroe. Who can predict that such development will not reach the only one of the three peninsulas at Hampton Roads not yet touched by the wand of twentieth-century progress?

Norfolk has her fashionable boulevard, extended by the electric railway to Virginia Beach, from whence it runs northward toward Cape Henry and southward along the Atlantic coast toward the North Carolina state line.

The "Banks" really begin at the southeast corner of Virginia. This ribbon of sand averages in width about a mile, and is two hundred miles long. There are thirty miles of water on one side of the strand and the broad Atlantic on the other. The villages, of necessity, seek the high ridge and stretch out along a general highway. Here and there where the land widens (at Cape Hatteras it is five miles in width) there are forests and swamps, but as a whole this is the most salubrious strip of land in the world, the ideal boulevard, both for residence and health. Often, for miles, the little settlements are so close together that there is one continuous, well-populated street. With adequate communication, this great boulevard along the "Banks" would be seized by speculators and built up in a twinkling.

Think of a boulevard two hundred miles in length, the mighty waves rolling up to the front yards of the houses on one side, the placid waters of the Sound lapping at the back yards on the other. At present it takes all of three days to meander down the length of this great boulevard by a naphtha launch, and even then there is a break in transportation facilities between Hatteras and Ocracoke Inlets, a distance of fifteen miles, which the government has been petitioned in vain to bridge with its naphtha launch mail service. At present, the only means of communication is by means of chartered sailboat or gasoline launch.

The land vehicles on the "Banks" are small, open, wooden carts with never more than two wheels, and the tires of these are of great width, as this part of greater Broadway from end to end is of heavy white sand, into which an ordinary wheel would sink almost to the hub. But along the beach of this marvelous strip, at low tide, there is a wonderful auto-roadway, unsurpassed by any in the world. When the inlets are bridged, as they will be some day, there will be a straight stretch from Cape Henry to Cape Fear. There is scarcely room for more than one continuous street on the "Banks," and so far not a negro lives in that street. It is one of the peculiarities of the "Banks."

It is not likely that the great American street will ever extend as a continuous, populous boulevard, or interurban roadway, beyond Wilmington. The swamps of Carolina place a barrier which seems to bar the progress of the great roadway,

but from the mouth of the St. Lawrence to the mouth of the Cape Fear River is many hundreds of miles, more than a thousand; for ten hundred miles, at least, the great international populated street already exists in more than embryo form.

It is not strange that the greatest street in the world follows the world's most wonderful inland waterway. It is possible for small boats to-day to sail from the mouth of the St. Lawrence, inland, to the mouth of the Cape Fear, or a launch leaving the beginning of the great street, at the little French-Canadian town of St. Anne de Beaupre, might puff away more than a thousand miles through and by the great populated roadway, up the St. Lawrence and Richelieu Rivers, through Lake Champlain and the Canal to the Hudson, down that thickly populated stream to the Raritan River and Canal, across New Jersey, and down the Delaware to the Chesapeake Ship Canal, through this waterway, and down Chesapeake Bay to Norfolk and the Dismal Swamp Canal, and on through Albemarle and Pamlico Sounds to the Cape Fear River. At present, the great American street belongs to the small boat; soon the government will make a ship canal of its entire length, and the result that must ensue will doubtless cause the world to marvel at the birth of a continuous city, one thousand miles across.

At one end of this great street, the smallest children smoke pipes like old men; at the other end, they chew tobacco; in between, the most precocious race the world has ever seen make a living and give to the world's longest street a complexity and interest that has no rival in the universe. I have traveled from one end of this great street to the other. The journey is over now, yet I am traveling back the way I came, greeting old acquaintances and making new ones. One can never become entirely familiar with a street more than a thousand miles long, parts of which change every day of the year and become new with each of the seasons.

Other lands may possess more diversified attractions, but none such a main artery of trade, and life, and pleasure, as America's greater Broadway, an artery that throbs with active life for a thousand miles, taking and giving back rich red blood from its great pulsing heart, Manhattan Isle. *Our* Broadway is but the great ventricle that pumps life to both extremes, and through which must pass all those atoms along the greater highway that enjoy life, and those great thrills that make it worth living.

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# WHAT IF RUSSIA HAD A LINCOLN!

BY

ELIAS TOBENKIN

THE gray mist thickened visibly and enveloped the village from end to end. In the peasant huts the fires went out one by one. The long rows of thatched cottages, covered with moss, shone in the moonlight like mammoth lizards. A troika carrying the mails from the nearest town, thirty miles away, dashed through the streets, the bells on the horses' collars ringing wildly through the night. It was nine o'clock. In a few minutes the belated fires on the market place also went out, except at the village inn. There a murky light was burning, more for the sake of appearances, however, than out of actual necessity.

Another quarter of an hour, and night, the calm, quiet night of Southern Russia, lay upon Bednotovka, in all its majesty and splendor and pain.

The *sarai* (fire station) alone, which stood at one edge of the market place, a sort of an out-of-the-way and yet ever-ready position, had its customary, in fact, more than customary light, that evening. For, in addition to the lantern which was seated high on a post in front of the door,

# The New South America

## I.—THE NEW BRAZIL

BY

PAUL REINSCH

PROFESSOR OF POLITICAL SCIENCE, UNIVERSITY OF WISCONSIN
MEMBER OF THE PAN-AMERICAN COMMISSION

*In speaking of New South America, we are not so much dealing with the accomplished fact as, on the one hand, with the undeveloped resources — the promise of the future, which awaits the application of modern methods and, on the other, with the awakening of the people in these countries — both their native and foreign residents — to the opportunities which an industrial transformation holds out. The foreign commerce of South America is at present largely in the hands of British, German, French and Italian merchants. They have cultivated that territory, are familiar with its needs, and are supplying them with great efficiency. The cardinal fact is that they have the commerce because they have an interest in the country. There they have colonies, either of agriculturists or of merchants. They have money invested in railways, mines, banks and various public service undertakings.*

*In our modern world, commerce does not develop by itself. It is closely bound up with general industrial interests. So, when it is said that a great field awaits American commercial enterprise in South America, this must not be understood in the sense that there are millions of natives anxiously waiting to purchase any American goods that may be sent down. There are opportunities indeed, but the field is not clear and the customers will have to be acquired by a slow and expensive process. The really great opportunity lies rather in the combined development of industry and commerce. As soon as our industrial enterprises are extended to South America, and capitalists begin to interest themselves in its countries, the growth of our commerce will follow as a matter of course, because it is financial influence that determines the current of commerce in these days. This is the first consideration, although we also need a more flexible tariff under which we can give or refuse advantages to other countries, and we need legislation which will make it possible to build up an American merchant marine.*

*For the purpose of introducing American commercial enterprise, it is utterly useless to send catalogues. It is far better to send representatives, but the only way in which we can hope to equal, and in time to outdo, the achievements of European enterprise in South America, is for the leaders in our industrial world to interest themselves personally in this great field open to our action. It is important at the present time, so critical in the industrial history of the world, to consider the New South America — the South America of the future — as far as it exists in undeveloped resources and in the industrial ambitions and impulses of its people. If in these studies we should seem to emphasize the difficulties which confront the establishment of modern industrial methods in South America, this is not done in a spirit of carping criticism or of lack of confidence in the future of those countries, but for the reason that a study is not a prospectus, it must consider all the circumstances, both the opportunities and the difficulties, which have to be overcome.*

sented what is the commonly accepted view among critical scholars as to the opening eleven chapters of Genesis. This engaged the attention of Dr. Carman, general superintendent of the Methodist Episcopal Church of Canada, who attacked Dr. Jackson with great bitterness. The discussion caused widespread interest and indeed excitement in ecclesiastical circles in Toronto. The conservatives discovered further that in the University of Toronto, a state institution, views similar to those of Dr. Jackson were propounded in one of the classes in Semitic literature. They promptly discovered some law which would prevent the teaching of the Bible in any way in the university. Dr. Carman in the meantime was quietly compelled to publish a retraction of his offensive statements, and Dr. Jackson is left in possession of the field, so far as his own case is concerned. The question of Bible teaching in the University of Toronto, however, is still open, and it would not be strange if the zeal of the extreme conservatives might prevent the genuine scholarship of that great institution from expressing itself in any form of Bible teaching.

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**Christian Education in China**

In recognition of the psychological moment for giving China the assistance she most needs in educational affairs, committees have been organized in England and America "to promote a larger interest in Christian education" in that empire. The English committee is endeavoring to raise a fund of $500,000 to be used in aid of union medical training colleges, union normal colleges for the training of Chinese teachers, and union divinity or theological colleges for the training of Chinese pastors and evangelists. Aid will also be given to the unifying of the literature and tract societies already at work in China. The American committee, of which Rev. Dr. Arthur J. Brown is chairman, purposes to assist in increasing the funds at the disposal of the various missionary boards for Christian educational institutions in the Chinese empire and to coöperate with the General Education Committee appointed by the Shanghai Conference and with the China Educational Association. The committee lays stress on the need for Christian teachers, preachers and books. "The Chinese," it says, "can never be permanently led from the outside. They must be led by their own men. Our province is to see that they are actuated by the motives of Jesus Christ." To quote further:

> We are in strong sympathy also with the thought of the British committee that the chief colleges should, as far as practicable, be union institutions.
>
> We believe that the colleges to be most influential should give thorough instruction in the Chinese language, with courses in modern languages, particularly English; that the foreign professors should represent the highest type of western ability, culture and Christian character; that as a rule they should learn the Chinese language; and that they should tactfully adapt themselves to the Chinese mind and character.
>
> That the institutions should be vitally Christian is evident. China needs financial help in the direction of a purely secular education less than any other nation in the world.

**A Papal Excommunication**

The Vatican has again demonstrated its opposition to modern thought and freedom. Father Romolo Murri, a Social Democrat and a leader of the Catholic Liberals, was publicly excommunicated at Rome on March 21. He is thus deprived of all ecclesiastical communion, the form used being equivalent to an anathema. There are apparently two causes for this action. Father Murri has been, since 1902, director of the National Society for Cultural Education, which publishes a monthly magazine in the interests of Christian Socialism. That he continued in this position after being warned that it was obnoxious to the Holy See, was one offense. The other was political in character. He had stood for a seat in the Italian Parliament and had publicly criticized the policy of the Pope in political affairs. This in 1897 caused his suspension from ecclesiastical office. But he failed to submit to the curia, accepted a nomination to Parliament and was elected a member of the Chamber of Deputies at the last general elections. This was the last straw and the sentence of excommunication followed. He thus becomes a companion of Professor Schnitzer of the University of Munich, who was about to violate a command of an archbishop to cease lecturing when he was sent on an enforced vacation.

A BUSY THOROUGHFARE IN SAO PAULO
After Rio de Janeiro, Sao Paulo is the largest city in Brazil

IT is impossible to realize the difficulties that stand in the way of a complete development of the natural resources of Brazil without forming a clear conception of the geographical situation of that vast republic, in extent larger than the United States without Alaska. Its very size, given the overpowering character of tropical nature, its magnificent distances, are both an advantage and an impediment. Brazilians, when they consider the size of their country and the vast resources which undeniably exist in it, are at times dazed by such opportunities and persuade themselves that their country is already one of the greatest in the world, although, as a matter of fact, thus far it only has an almost certain promise of really attaining to that fortunate position. It is often said that Brazil is a wilderness with a fringe of civilization surrounding it. An explorer who recently traversed Brazil from the Atlan-

tic to the boundary of Peru told me that for two hundred days he had not seen a white person. Yet the "fringe" must not be understood as being a very thin band. In places it is hundreds of miles wide and it penetrates into the wilderness up along the river banks for long distances. Yet, even in the most advanced state of Brazil, the State of Sao Paulo, a large area is marked as unexplored country on the latest maps.

Brazil holds the distinction of being the most important tropical country in the world. All the charm and interest of the tropics have entered into its civilization and are expressed in its literature. But nature in the tropics is a powerful mistress; her very exuberance and fertility prevent men from thoroughly subjugating her. If the engineer builds railroads and highways, their embankments are washed away by the tropical rains. The clearing which the colonist makes in the forest would be covered again with a heavy vegetation were he to turn his back upon it even for a few weeks. Telegraph poles and fence-posts put forth green branches and new railway ties have been known to sprout, in the wet season. It is not surprising, therefore, that in many parts of Brazil we encounter evidences of a recession of man before nature. Deserted manor houses, tumbled-down buildings that formerly made up a prosperous settlement, portions of highways no longer used for traffic—such signs of decay are often met with. They indicate the constant stress and strain in the struggle against nature and the frequent defeat of man in his enterprises.

The vast area of Brazil may roughly be subdivided into three great regions of production. The north, composed of the basin of the Amazon with such majestic tributaries as the Madeira, the Tapajos and the Rio Grande, forms an empire by itself. The region about the upper waters of the Amazon, partly under dispute with Bolivia, Peru and Ecuador—the region where the Acre territory is situated—though still almost entirely undeveloped, contains a wonderful abundance of natural resources, which are attracting settlement and bringing about the creation of cities and towns. All along the Amazon, the rubber industry is the chief source of wealth, though precious woods and, in fact, nearly every kind of tropical product may be exported from this region. The rubber industry has its own peculiar organization. Rubber is not cultivated, but acquired from the forest trees. The na-

A MODEL OF THE MUNICIPAL THEATER AT RIO

This theater, which is now completed, stands, with the Theatre Colon, of Buenos Ayres, as the finest of American playhouses

tive rubber hunters follow certain paths in the forest which are considered as in a way belonging to them. The product which they gather is delivered to river merchants, to whom they are indebted for

ONE OF THE MODERN OFFICE BUILDINGS OF RIO DE JANEIRO

several years in advance. These river merchants are bound in a similar relation to the exporting houses. Last year an effort was made in one of the states to crowd out foreign houses by obtaining a remission of the export duty for native syndicates. This effort was, however, defeated by the central government upon diplomatic representations by the nations interested.

The second region is the subtropical area in which the great States of Minas, Rio de Janeiro and Sao Paulo are situated. In this region coffee has been undisputed king for many generations. Other products such as sugar, corn and rice are also produced, but not in sufficient quantities to deprive coffee of its absolute predominance. It is here that the wealth and intelligence of Brazil are centered, that political life is concentrated. The public men of this region form the controlling group in the state. Since the creation of the republic they have been able to organize and sway political action.

The third and smallest region is composed of the three southernmost states, Parana, Santa Catherina and Rio Grande

AN ELEVEN MILLION DOLLAR BOULEVARD

The Avenida Central, which was cut through the most populous part of the city, was started in 1905, and completed in twenty-two months. The sidewalks are twenty-three feet wide and the roadway is sixty-two feet wide

do Sul, where, in a moderate climate, farmers devote themselves to cattle raising and grain culture. Though small compared with the rest of Brazil, these states form an area of great promise for future development. Extending from the sea to the Parana and Uruguay Rivers, their territory, variegated by low mountain ranges and amply watered by streams, enjoys unusual facilities of communication and a climate that is in most parts delightful and healthy. In general, the climate of Brazil, outside of the low regions surrounding some of the coast towns and in the river valleys, is not unhealthy and oppressive, as tropical climates are commonly believed to be. The inner plateaus, at an altitude of more than three thousand feet, have a climate in which white men may work in good health and with undiminished energy. To these three regions we may add as a fourth, the almost impenetrable forest area, the Chaco, drained by the upper waters of the Parana and Paraguay, in which so far practically no economic life has been developed.

Each one of these vast regions has its own local characteristics which condition economic and industrial life. The organization of the rubber industry on the Amazon has nothing in common with the plantation labor supply in the southern part. Yet everywhere we encounter a scarcity of labor forces, which fills Brazilians anxious for national development with something like dismay when they consider the tremendous tasks which confront their nation. The Indian races furnish labor in the rubber regions and to a certain extent on the plantations, but they are not easily harnessed to the steady task work which is necessary for a subdual of the natural forces. Negroes were imported into Brazil in large numbers during the days of slavery, but since its abolition, a generation ago, they have lost their importance as an efficient labor force. Instead of working on plantations, they prefer to buy their own little plots of ground, living almost entirely on the bounty of nature; such large cities as Pernambuco and Bahia are especially attractive to them. They are found in large numbers in the Brazilian army and also in the lower civil offices. The Brazilians are thus forced to look abroad for a labor supply. Some labor comes from Portugal, Italy, Spain and Southern Russia, but the quantity of immigration is too small to settle the main problems. In 1908 the total immigration into Brazil was only

ninety-four thousand. The immigration into our country is thirteen times as large, one million two hundred and eighty-five thousand. The European immigrant does not look forward to a peon's life. If these men hire out at all, they demand high wages; and as soon as they have earned a few hundred milreis they migrate southward to Uruguay or Argentina, where agricultural colonies beckon to the Italians and Spanish. Recently the governments of some of the states have turned to Asia, that unfailing well of humanity. Last summer several thousand Japanese coolies were brought in. The Japanese minister to Brazil expressed himself to me in optimistic terms as to the possibilities of Japanese settlement, and yet he himself considered the whole movement as still in the experimental stage, as the effect of the Brazilian climate upon Japanese immigrants is yet to be tested. A steady and efficient labor population remains the prime need of Brazil.

It is natural that in a tropical country where certain articles are produced with great ease and in abundance, economic efforts should take the line of least resistance even to a greater extent than is true in a country of moderate climate where efforts are plainly commanded in order to realize wealth. Thus in Brazil there has been an excessive reliance upon certain staple products, especially rubber in the north and coffee in the south. To a certain extent, individual enterprise has been atrophied. The immense natural wealth of the republic has seemed to make it unnecessary. This tendency has been emphasized by a desire to use the government for the purpose of supplying the place of individual initiative. The economic policy of the republic has therefore generally taken the tendency of monopolistic arrangements and government assistance. The latter must indeed be relied upon to a certain extent in the development of a tropical country. Only praise is due to such efficient work as that of the agricultural department of the State of Sao Paulo in its efforts to lead the way in diversifying the agricultural production of the state. But it is not easy to judge favorably of the famous coffee valorisa-

MOUNDS OF COFFEE ON THE DRYING FLOOR

Although coffee is still king in southern Brazil, considerable progress is being made in diversifying the agricultural products. Sao Paulo sold $14,000,000 worth of other products last year, but the coffee shipments from Santos alone were nearly $100,000,000

tion scheme, of the high customs duties and of the policy which permits the excessive charges in Brazil for transportation services. Under the valorisation scheme, as is known, the government of Sao Paulo acquired a large store of coffee (eight million sacks) for the purpose of preventing a flooding of the market and of equalizing the price by a proper distribution of the supply. The hope that the level of price could be maintained by such government action has, however, been disappointed. The entire financial resources of the state have been subjected to a dangerous strain, and there has been a serious risk of a financial crisis. The doubtful policy of this great enterprise is so apparent to-day that there are practically no longer any public men in Brazil to defend it. How to get out of it with the least damage is the one question which they are considering.

An excessive system of import duties has been imposed upon the country. Now it is known to be one of the commonplaces of financial science that a tropical country needs as much freedom of trade as possible. Its natural products need no protection. Their development will be encouraged, not through a system of high duties on machinery and objects of consumption, but by a system as nearly approaching free trade as the revenue needs of the country will permit. In such a country a protective system must be a hindrance to the main industries, because it results in a higher cost of living and consequently in a higher price of labor, without in any perceptible degree adding to the well being of the country. It is true that under the protective system, certain manufacturing interests have been built up in Brazil, especially in the textile manufactures; but it is doubtful whether these are dependent for their life on the system, and it is certain that the advantage obtained is not commensurate with the sacrifice of general freedom in economic development. The monopolistic nature of Brazil's economic policy manifests itself in many other ways. The coast-wise carrying trade is entirely in the hands of one steamship company, which has established a scale of freight rates under which commerce can not freely develop. The high cost of inland trans-

PART OF THE MUNICIPAL IMPROVEMENTS OF RIO

The Avenida do Mangue shows the treatment of a canal which acts as an outlet for the rainwater and small rivulets of the section

THE AVENIDA BEIRA-MAR

This is part of the new boulevard system of Rio, which with other municipal improvements, has cost the city $40,000,000. It is probably unsurpassed for picturesque beauty by any drive of equal length in the world

portation resulting from the charging of monopoly rates is the most serious drawback to the internal development of this great republic.

The chapter of difficulties in the way of rapid development of Brazil's economic life is not closed without a mention of the lack of efficient organization. The Brazilian chief of a department generally carries in his head the entire business of his administrative branch. He will rarely use his subordinates as associates in carrying the burden of responsibility. He will even load himself with details, which an ordinary clerk might perform, and will write with his own hand orders and letters which could be dictated to a stenographer in one-tenth of the time consumed. This lack of organization results not only in the waste of energy on the part of the more important public officials, but it also deprives the younger men of the opportunity of sharing in the actual responsibility and coöperating in an efficient manner with their chiefs. To this it must be added that the officials, both of the government and of private corporations, very often do not feel any responsibility beyond their actual term of office. Thus it is reported that when an important railway official was asked why he preferred to buy very cheap and unsubstantial engines rather than such as would endure, he said: "They will last as long as I expect to hold my position." The desire to make a good showing in the accounts of the actual period of office often leads to the starving of the service in the purchase of inferior material and in generally discounting the future.

These observations on the economic policy of Brazil are not the reflections of

A COTTON FABRIC FACTORY IN RIO

A creditable beginning of a development of manufacturing, which may be expected to extend to many lines, is shown by several large textile factories in Rio and Sao Paulo

an outsider, but on the contrary they are based upon conversations with Brazilian statesmen in administrative positions and in the National Congress. There is a very clear perception among them that radical changes in economic policy are necessary. Most of the prominent and influential men desire to liberalize and unfetter the trade of their country and to set free its vast economic resources. But the transformation of such a system is not an easy matter. The fiscal needs of the government are very great. They can not be materially reduced and the creation of new sources of supply takes time.

The consideration of these temporary drawbacks to the rapid advance of Brazil and her economic welfare by no means leads to pessimistic conclusions in an observer who sees the wonderful potential resources of Brazil and who comes in contact with the progressive spirit that animates her leading men of action. It is not easy for a state to shake itself loose from economic methods inherited from a period when slavery and other easy-going methods of wealth-production prevailed, but the statesmen of Brazil see clearly what conditions will have to be overcome and are energetic in their efforts to place the economic life of the country upon a more natural basis. In talking with these men, one can not help being impressed with their earnestness, the energy of their intellectual effort, and the general *élan* with which they throw themselves into their work. Such ministers as the Senhores Bulloes, Müller and Calmon, hard-working men who analyze carefully every situation they have to deal with, have a clear view of the economic needs of their country. Among the senators and deputies there are also many whose mastery of the facts and principles of economic life and whose carefully considered ideas on economic development give the assurance that while Brazil has her difficulties, as every other country has, her leading

men are attacking these problems with intelligence and energy.

This zeal for improvement which we have spoken of, at times leads to great outbursts of energy. Five years ago it was decided that Rio should become a modern city with broad avenues, a perfect sanitary system and docks sufficient to accommodate the vast seaboard commerce that comes to its harbor. The actual performance during the five years that have elapsed can be compared only with the transformation of Paris under Baron Haussmann, and is indeed far more marvelous, considering all the circumstances, than that feat of modern city building. Broad avenues were cut through the center of the most populous districts. Along the coast of the surpassingly beautiful bay there was constructed a triple boulevard for horsemen, carriages, and automobiles. For more than twenty miles the shore of the bay has been lined with embankments or quays of solid masonry. Beyond the district of residences and coastal drives comes an imposing series of harbors, basins and docks, with twelve miles of landing quays, sufficient to accommodate the commerce of Rio for a century to come. The city has also been provided with a fine municipal theater, which, together with the Theatro Colon at Buenos Ayres, stands at the head of the list of American playhouses. The cost to date of these improvements confined to the one city of Rio alone has been over $40,000,000. It is not surprising that after such an effort there should come a certain relaxation and that the expenses incurred should have strained the resources of the country, but the bold conception on such a marvelous scale followed by immediate execution, testifies to the constructive capacities of Brazilian statesmen. The transformation achieved is almost magical in its effect. Rio has always been one of the most beautiful cities of the world; in fact, its surroundings are equaled by none. But this beauty was a free gift of nature; as a city of human construction, Rio was cramped, crowded and dirty. Now a startling change has come over it; it has been transformed into a city of magnificent thoroughfares setting off with double advantage all the natural beauty of bay, ocean and mountain background. Its streets are finely paved; it is clean and healthy to live in. The smallpox epidemic which ravaged the city last summer was due entirely to the ignorance of the mass of the population, who had refused to become vaccinated. In this terrible crisis, the sanitary department performed excellent service. As for malaria, yellow fever and other tropical scourges, they have disappeared from the modern Rio.

The first problem of modern industrial development is the constructing of adequate means of communication. The recent performances of Brazil in this field are not all that might have been expected. During the last five years of the empire the annual construction of new railways was 800 kilometers on the average. During the nineteen years of the republic the average has only been 425 kilometers. During the year 1907, 439 kilometers were built. The total length of Brazilian railways at the present time is eighteen thousand kilometers (twelve thousand miles). There is, of course, no trunk line connecting all the important cities of Brazil, but from every important harbor town a railway or railways extend into the interior. Pernambuco, Bahia, Rio, Sao Paulo and Porto Allegre are the chief central points of Brazilian railway systems. At the present time the national department of railways is bending every effort to mature and carry out plans for the purpose of connecting up these various systems.

As a matter of fact, railways have been projected and are in the process of construction, which will result in the existence of a trunk line from Bahia by way of Rio and Sao Paulo through the southern states to Uruguay. There is always some danger of strategical purposes interfering with industrial needs in railway building. It would be a great loss to Brazil and to American industrial civilization if the development of the communication system should be hampered for this reason. In dealing with communication in Brazil it must always be remembered that there exists a magnificent system of internal waterways. The ships of the Booth Line which leave New York once a month ascend the Amazon River to Manaos, the capital of Amazonas, and thence to the Peruvian port of Iquitos, a distance of three thousand miles

from the mouth of the Amazon. There are at least three tributaries of the Amazon that can be ascended for more than five hundred miles by ocean-going vessels. The navigation of the rivers of southern Brazil is nearly as astounding. All plans of Brazilian railway building take into account these river systems, which are all to be linked up into a great system of internal communication. If only the rates of transportation can be made more favorable, a notable era of internal development may safely be predicted for Brazil. The creation of modern harbor works is also an important part of the economic policy of the government. A contract has just been let for port works at Rio Grande which are to cost $10,000,000. They will be constructed by a French company.

Brazil, on account of its natural position as a tropical country, will always be noted primarily for its agricultural and extractive industries rather than its manufactures. However, in many lines of manufacturing a creditable beginning has already been made and a favorable development may be expected in the future. Both in Rio and Sao Paulo some large textile factories have been established, one of which is illustrated in these pages. There is also an opportunity for the establishment of factories making furniture, articles of dress, and that vast and varied class of objects known by the name of notions. While Brazil has no presently available coal, its wonderful supply of natural water-power is most favorable to development of industrial pursuits in the future. It especially lends itself to the development of the electrical industry.

In this connection, we should not fail to notice the achievements of the Rio Light and Power Company, a Canadian corporation. The system of power generation and supply created by this company is almost as marvelous as is the general transformation of Rio which we have already described. A few years ago the company began to acquire the various mule tramway lines in the poorer part of the city. It also secured a lighting contract from the government. A German company, which was then operating a large part of the electric tramway system, found it convenient to sell out to the American concern. Then the full extent of its plans began to be revealed. It had explored and purchased a magnificent water-power fifty miles distant from Rio, from which, at the minimum cost, it is enabled to supply the power of all the tramway lines of Rio as well as of its manufacturing establishments, and to generate electric light for the streets and houses of the city. The company also owns and operates the telephone system. Its work is carried on according to the most advanced technical methods. The managers of its various departments have been selected with the greatest care and are men who may well stand as the best representatives that North America can produce in business and technical ability. It does not surprise the traveler when he is told that "The Light and Power" has become the greatest single influence in modern Rio and, in fact, in modern Brazil.

It is impossible to fix any limits to the future development of Brazil in agriculture and the extractive industries. In the past there has of course been too much reliance on monoculture. Just as in the United States the economic life of one-half of the country was for a long time vitiated by the belief that "Cotton is King," so Brazil is at the present time suffering from an excessive reliance on rubber in the north and coffee in the south. This difficulty is fully realized by the Brazilians, and diversification of agriculture and industry is one of the main principles of the new program of economic life. In the states from Sao Paulo southward considerable progress has already been made in this respect. In Sao Paulo an excellent agricultural experiment station and college lead the way. While formerly coffee was practically the sole exported product, Sao Paulo last year sold other agricultural products to the value of $14,000,000. The value of the coffee exported from the one port of Santos alone, however, is from $70,000,000 to $100,000,000 per year. The far south, of course, with its opportunities for grain and cotton raising, has most diversified its production. Here agricultural societies have been formed and the most improved means for the diffusing of agricultural information are being employed.

When we consider the future industrial

# THE SOCIAL ENGINEER IN PITTSBURGH

BY

PAUL U. KELLOGG

IN a phrase or two, such as "a clatter of hoofs on the village street," Longfellow told how a horseman brought knowledge of a common foe to the Minute Men of Lexington and called them out to action. In these days, when a city is complex and spread out, it would take a week to gallop through the streets. Its common foes are not toddy drinking redcoats to be met at a bridge, but intricate, devious enemies that beset life from beneath, above, and beside hard to get at, hard to extricate from the general forces of city life, hard to hold up to view so that we can down them.

The Pittsburgh Survey was in a sense an attempt to do this sort of thing, and in as simple a way as I can—for the suggestion of other cities—I shall set down its principal features as a plan of work.

Municipal growth is bringing large problems to America, and any new method of approach which shows elements of general usefulness is worth going into. Pittsburgh is a type of those industrial cities in the United States not so big that like New York, they have lost self-consciousness, yet too big to manage themselves by the methods of little towns and older days. The country has demanded steel of Pittsburgh, and it has got it. The big men in the industry have gone after money in steel, and they have got it. One way of looking at the situation is to hold that the reason that the town itself has not prospered in a human way, comparable to its success as a production center, is because the interest and ingenuity of these men have been engrossed in great industrial projects, so that conditions have crept in in the social and civic life which have been wasteful and damning; and so that people who have stood for better things during the past fifteen years and more in Pittsburgh have felt that they were crying in a wilderness. But what could be done about it? Where profit-making enterprises have been dependent upon the present and future needs of the city, self interest forced a consideration of those needs that was fairly comprehensive; where human life and civilization have been at stake, this has not been the case. For instance, the Pittsburgh Street Railway Company some years ago elaborately plotted the whole urban area, estimating populations for years ahead, street by street, by wards and outlying boroughs, as a basis for extending its lines. In contrast to this, the Pittsburgh Bureau of Health for the years from 1899 to 1907 did not issue an annual report showing how people died; no wonder the city failed to take adequate measures to keep them from dying. Our effort was an experiment in applying to conditions of life and labor as accurate methods for determining present needs and tendencies

as had been found worth while from the point of view of five-cent street car fares.

The Pittsburgh Survey, then, we said, was a first-hand inventory of social and living conditions in the American steel district. Its business was to get at facts and to put those facts before people. It was no part of its elementary function to undertake to bring anything about.

It was called the *Pittsburgh* Survey because that was the name of the laboratory where the work was carried out—not because its results would have merely local significance.

It was called a Survey because we proposed to employ methods of social engineering —to go over the field somewhat in the way the geologist plots the ores and elevations of a mountain chain, or a railroad explores the country it is going to penetrate with viaducts, tunnels, and grades, or a modern farmer takes an inventory of his soil and stock.

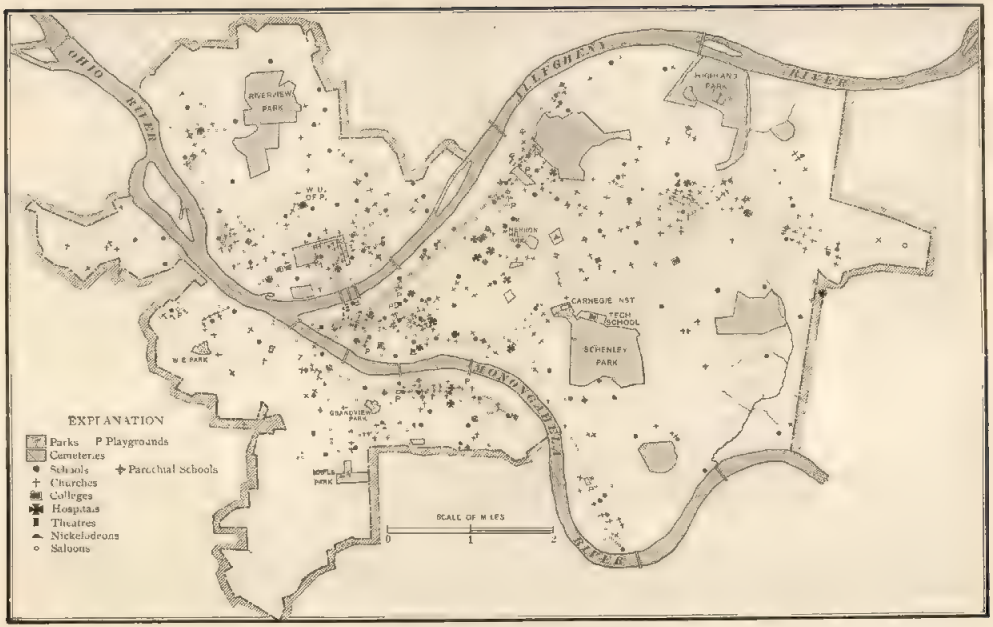
Before going into the history of the undertaking, let me put down four elements for our plan which in their combination, at least, mark it off from other enterprises.

First, we brought the experience and the experts of a whole range of cities into one in a belief that such a study of that one would be nationally suggestive. Thus we brought to Pittsburgh a State factory inspector whose pioneer work in Illinois set standards for the rest of the States; a member of the faculty of the Woman's College of Baltimore who has specialized on the social bearings of primary school education; a sanitary inspector of twenty-five years' experience in another great city; the best plumbing inspector in the United States; a mendicancy expert whose name is known among yeggs and police officials throughout the country; an American health officer whose methods for obtaining clean milk for a municipality are standard throughout Europe; the secretary of the famous New York Tenement-House Commission of 1900; one of the chief experts of the Federal Industrial Commission of 1900, and so forth. It would be interesting to speculate on the advances which any single city would make could it command permanently the services of such a staff of specialists picked from the working force of other municipalities.

Second, we considered the town as a whole, technically and geographically. There have been many studies of child labor, industrial education, housing, tuberculosis, sanitary problems, and crime carried out in one part of the country or another, and at one time or another. Here we considered these and other social problems in their groupal relations; we studied them as manifested currently in the workings of one city. Such a consideration brought out that all of them are inexorably related, and not one can be solved adequately without a general improvement of living conditions. Thus, while typhoid fever is attributable primarily to an infected water supply and Pittsburgh has built one of the greatest filtration plants in the country to lessen it, the Pittsburgh Typhoid Fever Commission, with its staff of bacteriologists, physicians, and sanitary engineers, has been at work for over a year in studying secondary sources of infection. For here, as elsewhere, the typhoid problem involves the whole housing problem. It is in the vaults of the old residences of Pittsburgh, in the common hydrants and common privies; in the water taps reached only by going through the living-rooms of adjoining families; in vaults emptying upon open hillsides; in the cluttered housekeeping of one and two room families where cook and nurse are the same person; and in the lodging-house conditions where men sleep five, eight, and ten in a room, that the secondary sources of contagion have been traced. Moreover, back of this housing problem is the whole taxation and transit problem of a city shut in between hills and rivers; just as back of the water and sewerage dilemma Pittsburgh has had to face has been the sanitary problem of the whole range of mill towns in the river valleys above, for there are those who hold that a thoroughly polluted stream cannot be entirely purged by the best filter. Back of that again has been the problem of floods, which inundate large regions of the inhabited lowlands each year, and beyond that the problem of forestation on the scarred mountain ranges of western Pennsylvania and West Virginia, which involves the well-being of the whole region: just as back of the sick-room found

PHOTOGRAPH BY LEWIS W. HINE

THE ONES WHO NEED THE SUNSHINE




A MAP OF PITTSBURGH'S SOCIAL CONDITIONS

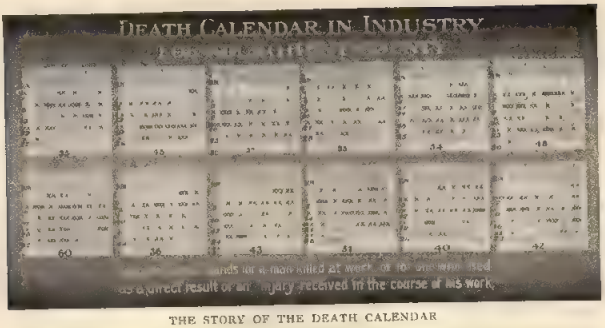
by our visiting nurse, with its improvised cots, where an entire family lay ill of the fever, was the whole hospital problem of the city, where institutions, subsidized by the State and supported by gifts, have been known to refuse fever patients because they were not only sick but poor.

In another and even more obvious way our work brought out the fact that the civic and sanitary needs of a city must be dealt with as a unit. I mean in the matter of geography. To beautify life in one section or neighborhood, like the East End in Pittsburgh or Brookline in Boston, may do no more than relieve well-to-do people from the necessity of laying hold of ills which beset the community at large and to put off spending the time and money which are necessary to rid the community of those ills. Again, merely to describe the piled-up evils in a slum neighborhood such as Skunk Hollow or Sawmill Run in Pittsburgh may only confirm the complacency of well-to-do sections. A town must do business as a whole. Let me illustrate: We found in Pittsburgh good schools, well-managed hospitals, excellent settlements; yet the schools are maintained on a vestry system of ward control and taxation (except as to teachers), and in some districts, where the children have least cultural influences at home and where the teachers need the best equipment the city can put at their disposal, they were found to be housed in old fire-traps with a hundred or more children in a room, with the rooms badly lighted and badly ventilated, and with plumbing facilities which were downright indecent. Again, districts where great numbers of children live were found to be without any large amount of taxable property, while the piled-up wealth of the business district of Pittsburgh dodged any taxation for school-building construction and maintenance except for a few hundred children. Again, because of this very absence of centralized control, there are wide discrepancies in expenditure. For instance, in the year studied it cost twice as much to light 470 children in one school as it did 1,062 children in a neighboring district.

PHOTOGRAPH BY LEWIS W. HINE

A WAIF OF THE INDUSTRIAL DISTRICT

Turn to another social institution, the hospitals. Through the action of an autocratic board of trustees, one hospital plant, erected ten years ago in Pittsburgh as a memorial, has never been thrown open; but this to us was not so significant as the fact that when seven new hospitals which have been building in the last year or so are completed, they will be found to operate in overlapping spheres of service



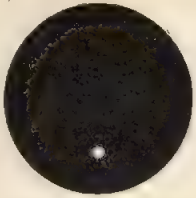

THE STORY OF THE DEATH CALENDAR

near the well-to-do sections. A great belt of river wards where disease is rife, where home conditions make hospital service sorely needed in case of sickness, will be entirely without convenient hospitals. Here, again, we found need for the city to plan as a whole instead of letting each institution work out its salvation on its own lines. Another example—the vigorous neighborhood work at Kingsley House and Columbian Settlement in the Hill District, and at Woods Run House in Allegheny—is a plea for similar activity in other parts of the city which need it as much; with one or two exceptions, the Pittsburgh school-houses are not serving the social needs of their neighborhoods in a way comparable to the civic centers in the Rochester public schools.

A comparison of hospitals and schools with, we will say, the telephone system of Pittsburgh, or the moistening omnipresence with which the brewing interests plant the district with saloons, will make my point. But it is not necessary to go out of the range of social work for comparison. The Carnegie Library in Pittsburgh, through a system of branch libraries, library clubs, and centers, is an example of a city-wide system of library service which is probably not matched in any other municipality in the country.

By considering the town as a whole, then, we saw the interaction of social and sanitary problems, and found the need for a more comprehensive treatment of the whole city area by social, medical, educational, and recreational agencies.

In the third place, we studied civic and industrial conditions at the same time. For the most part, civic commissions and labor bureaus have not had much to do with each other. Yet these two factors as found in the life of an industrial district are utterly bound up in each other. What good does it do an employer to get skilled men, to give fair wages, to work short hours, in the hope that the efficiency of his men will respond, if the water supply these men drink is bad and sickens; if the houses they can rent near the works are poorly ventilated and primitively equipped, so as to lack comfort, healthfulness, and refreshment; if the air is contaminated by a hundred privy vaults; or if the car service to the suburbs is so wretched that it fags out the strap-hangers?



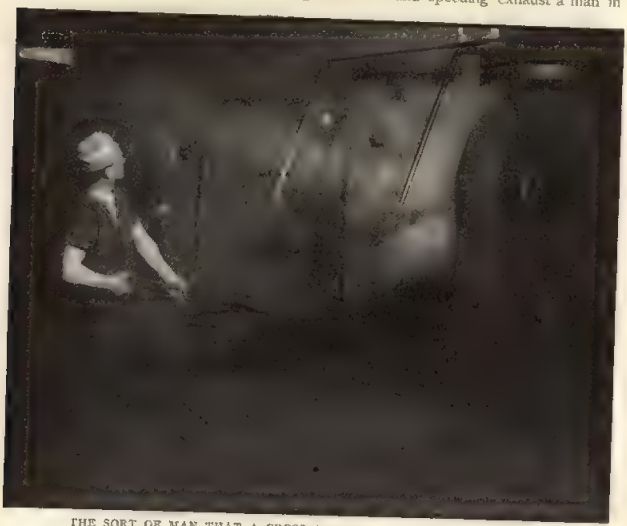
Black circle shows total loss of income to six men totally disabled for life (based on earnings and expectation of life). White circle, total compensation paid to these six men

Turning the question round, what good does it do a city to build great filter beds, parks, and libraries to give dignity and delight to life, if you deny people all decency and security by the conditions of their employment—if the pay and hours make a pitiful farce of home life, as we know home life in America; and if the treatment of the immigrant labor gangs in the works

brutalizes clean country boys, as their parents knew them in the old country?

Applying this twofold standard to the steel district, we noted, on the one hand, that there has been much building in Pittsburgh in the past ten years by private owners and real estate companies, yet the population of the district has swelled so enormously that it was no exaggeration to say that by 1907–8 the supply of shelter had broken down. As extreme instances, we found men standing on street corners in the evening waiting for beds to be emptied of night workers who had slept in them during the day; and we found five hundred people in a row of houses owned by the United States Steel Corporation dependent upon one pump for their drinking water. Two great manufacturing concerns who thought of coming to Pittsburgh decided against it that year, purely on the ground that there were not housing facilities at hand for the sort of working force which was indispensable to them.

On the other hand, we found that in mill towns like Duquesne, Braddock, and Homestead, where the twelve-hour day governs, where in the blast furnaces there is a seven-day week, and where, as in many departments of the steel mills, when night and day shifts change once a fortnight, the workmen put in a long turn of twenty-four hours in the heat and drive of the mill, where unionism has been crushed out so hard and persistently that workingmen never meet together as such, and where the heat and speeding exhaust a man in the long hours—we found that these labor conditions were costing those communities dearly. The men cannot be the sort of fathers, citizens, social human beings which they have the stuff in them to be if the industry made less protracted demands on their physical and nervous energies. These boroughs lack the "get up and go" of Western towns. Duquesne is a sad contrast to a spruce New England village. Under the eaves of the Carnegie steel plant in Homestead, one child in every three dies before it is two



THE SORT OF MAN THAT A CROSS ON THE CALENDAR STANDS FOR

A PLAN WHICH PITTSBURGH ARCHITECTS PROPOSED FOR A NEW CITY HALL

years old, because in this Second Ward where the immigrants live the health conditions are at low ebb. Yet some of the fairest people in America live in Homestead—their houses on the hillsides above show it. Indeed, too much of the burden of life is thrown on the home; the town itself had not collective virility enough for years to make the railway which runs through its very heart put up gates at grade crossings where each season brought a string of casualties.

Finally, our investigation dealt intentionally with the wage-earning population. We were not concerned primarily with the needs of the very poor, for Pittsburgh is a community of workers; nor with either the episodical doings of a millionaire lunatic or a steel president, or the art, music, and cultural activities of the well-to-do; but with those things which affected the normal life of the great bulk of the wage-earning population. It was the social well-being of America as a producing nation that we

sought to gauge. In our charity for the needy and our emulation of the self-sufficient rich, we have too often neglected the interdependent needs of those of us who are wage-earners and who must live in city aggregations where, unlike farming communities, a man cannot work out for himself many of the healths and goods and joys of existence as by-products of his ordinary day's work. A workman coming into a mill town must take the water supply which the town furnishes; must rent such a house as he finds there; must subject himself and his family to the schools, the courts, the health regulations which he finds in force.

In dealing with this wage-earning population in the Pittsburgh district, we tried to put our investigation on an individual and family basis; that is, instead of relying on abstract categories, such as death rates, or of telling pathetic stories of tragic individual figures such as the novelists use, we tried to draw upon the common experience. By systems of accounting and units of time and material, the modern manufacturer knows what the costs are that go into a finished shoe, or steel plate, or iron bedstead. So, too, the propaganda of the Bureau of Municipal Research pleads for such an ordering of municipal budgets and accounting as will get at just what the taxpayers' money goes for, where the wastes are, and what, for example, is the actual educational product of the twelve months' business of a public school. So we sought to get at those drains upon the means and life of a wage-earning population which the year brings round. Let me illustrate in the work of the largest single line of inquiry we prosecuted. Pittsburgh has had the highest death rate from industrial accidents of any industrial center in the country. Occasional writers have called the city a slaughter-house. When we talked to a public-spirited merchant, he would tell us that nothing was so cheap in the mills as human life; when we talked to the average mill superintendent, he told us that

A LIBRARY MAP OF PITTSBURGH

Showing how books are brought within reach of the people in all parts of the city by branches, sub-stations, and clubs

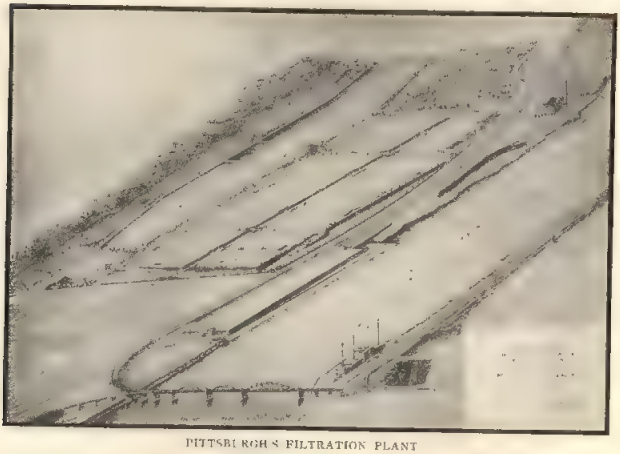
ninety-five per cent of the accidents were due to the carelessness of the men themselves. All these statements were wide of the mark. But no one knew how many were killed in industry, for the coroner's records were poorly kept; still less how many were injured, for no adequate reports are demanded of the mills by the State authorities, and the hospitals give out nothing as to their cases other than as so many amputations, fractures set, etc.

Our work began with a digest of the coroner's records for one year—July, 1906, to June, 1907. There was usually evidence that showed, not that responsibility could be fixed solely on one or the other agent in production, but that the man himself, his fellow-workman, his foreman, or his employer (as responsible for the construction of the plant, etc.)—that one or all of these had contributed to the accident. These data were checked off on a five-by-eight printed card, together with a story of the accident. These blanks were blocked out and submitted for criticism to the statistician of one of the great industrial insurance companies, a member of the Illinois State Industrial Commission, a State factory inspector, the statisticians of relief societies in New York and Chicago, etc. They were tried out on a month's cases, and the results resubmitted for criticism before they were adopted in their final form. In all, four blanks were used.

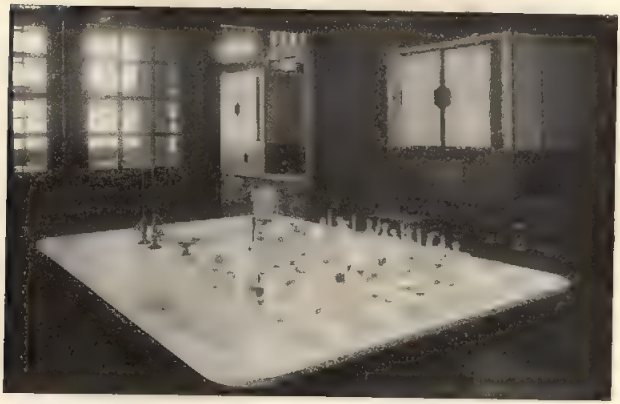
The next step was to visit the families in their homes. The industrial towns in Allegheny County are spread over a wide area. Railway and street car connections are not of the best. Tenants are constantly shifting, and a year had elapsed in some cases. Families of deceased foreigners go back to the old country. Half a dozen races and tongues were represented. It was no easy matter to run down these cases, but it was done in a majority of them. The responsible investigator in this field was Crystal Eastman, a graduate of Vassar and of the New York University Law School, who since then has been elected Secretary of the New York State Commission on Employers' Liability, to which she was appointed by Governor Hughes. The staff included as visitors a Cornell graduate and three interpreters—Italian, Russian, and Bohemian. These visitors elicited the family's version of the accident and secured facts as to the man's wages, number of dependents, insurance, savings, any payments by a Relief Association, settlements by claim agents or through the courts, etc.

The third step was twofold: first, to secure from a company's operating department its statement of the accident (visits were paid to the mills in company with technical men and a consulting electrical engineer whom we called in as counsel on our staff); and, second, to check over our facts as to wages, payments, etc., with the records of the claim agents and legal departments. In this last we were only partially successful. Such data were given us by a number of large concerns; they were refused by others.

The final step came in analyzing statistically the data thus gathered, and interpreting them with illustrative instances from the case records. The results were a body of facts more intimate and thought-provoking than any which hitherto had been brought out on this social and industrial problem in America. Within the past few months State Commissions have been appointed in New York, Minnesota, and Wisconsin, to make studies of industrial accidents and employers' liability in those States, and they will make use of these methods. I can do no more than suggest here the concrete nature of our findings. We found that of the half-thousand men killed in the year studied, half were Americans; that it was the ranks of steel workers and trainmen who suffered most—the pick of the workmen in the district; that 82 were under twenty years of age; 221 between twenty and thirty; that 50 per cent of the men killed were married, with families to support, and an additional 30 per cent were single men partly or wholly supporting a family; that over half of the men killed were earning less than $15 per week (thus disposing of the persistent legal notion that wages cover risk); that in 28 per cent of the cases the cause of the accident could be attributed solely to those killed or their fellow-workmen; in 30 per cent to the employer, or those who represented him in positions of authority; in 26 per cent to neither; in 16 per cent to both; thus disposing of the wide claims as to responsibility which had met us at



PITTSBURGH'S FILTRATION PLANT
The biggest civic enterprise



THE INCUBATOR ROOM
Where the health of the community is safeguarded

the start of our inquiry. More important, our analysis of the details of accidents showed a large proportion preventable; such as—

Faults in construction—projecting set-screws, shafts without railings, uncovered cog-wheels—conditions which we found repeatedly had been overhauled "after the man was dead."

Long hours of work and too great speed.

Inadequate inspection—resulting in broken chains, scaffolds, collapsed floors, a cracked grindstone, etc.—and failure to remedy known defects.

Inadequate warning and signal systems.

Inadequate instruction and direction of ignorant workers. For instance, in 22 out of the 132 deaths in which the men were in a measure responsible for their own deaths the victim was a "greener." Thirteen were not men, but boys.

We could point to the recent action of the United States Steel Corporation and of certain other individual employers in setting special inspectors at work in developing safety precautions in their plants. Here was a challenge to all employers, engineers, claim agents, and workmen in the district to get together in a general campaign to reduce the great death roll of industry.

When we made an analysis as to where the economic cost of these accidents fell, it came home to us with terrific force that the permanent method to keep down the accident rate would be to make killing and injury come higher to the employer. For instance, take six men who were totally disabled for life during the three months studied—one of whom lost an arm and a leg, one of whom is paralyzed, and four of whom will walk on two crutches the rest of their lives. Our figures showed that, of these men, one received $365, one $125, one $30, and three no compensation. Bearing in mind the broad policy of the Carnegie Relief Association, and of the standards of compensation set by exceptional employers whose names are known throughout the Pittsburgh District, the bald fact remained that Miss Eastman's tables showed that, in the case of both injuries and deaths, including both married and single men, *no dollar of compensation* was received from the employer to take the place of lost income[1] in considerably over half the cases.

Thus our inquiry showed that a large proportion of industrial accidents in Allegheny County was preventable, but that there was no concerted movement to prevent such accidents; that, as industry is carried on, another large proportion was unavoidable, but that in these, and all others, the economic loss involved was not charged off against the cost of production, to be met ultimately by the consumers, but fell on the families of the wage-earners themselves; breaking up homes, sending widows to work, taking children from school, and lowering standards of living. More than that, our inquiry disclosed profound dissatisfaction on the part of many claim agents, superintendents, attorneys, and progressive employers with the present master and servant law, which leaves these industrial losses to the gamble of the courts, and a disposition among them to give even-tempered consideration to ways out that will put American industrial practice on a footing comparable to the Workingmen's Compensation Laws in England or the Imperial Industrial Insurance in Germany. There are employers to be found in all parts of the country, no doubt, who treat their disabled workmen handsomely; but the common law in the different States is much the same, and the standards on which the general run of employers meet their responsibilities in industrial casualties may well be reflected by this Pittsburgh study, which for the first time interpreted the situation in terms of wage-earners' families in the aggregate. It showed a drain on the life and treasure which the working people of no industrial district can afford to meet; and which no industrial district can afford to have them try to meet.

At some length, then, I have stated the distinctive working methods of the Pittsburgh Survey. We brought experts from other cities to Pittsburgh; we studied the operation of social institutions against the background of the needs of the city as a whole; we considered civic and industrial conditions as interrelated; we limited our

[1] This excludes, of course, hospital and funeral expenses, often met by the employer.

# The Selection of Silver

When purchasing table silver—knives, forks, spoons and fancy serving pieces—it is advisable to choose a pattern *you know* will be continued for years to come. Thus the collection of an attractive design may be started in a small way and added to from time to time. The popular styles of the famous

## "1847 ROGERS BROS."

ware are maintained in complete assortment so that additions may be made at the collector's pleasure.

For over sixty years "1847 ROGERS BROS." silver has been standard in quality, durability and design. Each year since the original Rogers Bros. invented the electro-plating process has increased the fame of this exquisite *"Silver Plate that Wears."*

Sold by best dealers everywhere. Send for Catalogue "E-47," which describes all patterns.

**MERIDEN BRITANNIA CO., Meriden, Conn.,**
(International Silver Co. Successor)
NEW YORK CHICAGO SAN FRANCISCO

*Meriden Silver Polish, the "Silver Polish that Cleans."*

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THE YOUNG LADY
RECEIVED ALMOST DAILY A BOX OF

*Huyler's*

HOW OFTEN NOW DOES YOUR
WIFE RECEIVE A BOX
OF THE PUREST AND BEST
CANDIES IN THE
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TRY A BOX OF

"MY FAVORITES"

NUTTED CHOCOLATES ONLY.
SOLD AT OUR RETAIL STORES
AND BY SALES AGENTS
EVERYWHERE.

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# MENNEN'S

## BORATED TALCUM TOILET POWDER

**"Baby's Best Friend"**

and Mamma's greatest comfort. **Mennen's** relieves and prevents **Prickly Heat, Chafing and Sunburn.**

For your protection the genuine is put up in **non-refillable** boxes—the **"Box that Lox,"** with **Mennen's** face on top. Sold everywhere, or by mail, 25 cents—*Sample Free.*

Try Mennen's Violet Borated Talcum Toilet Powder—it has the scent of Fresh Cut Parma Violets. *Sample Free.*

**GERHARD MENNEN CO., Newark, N. J.**

**Mennen's** Borated Skin Soap (blue wrapper). Specially prepared for the nursery. **Mennen's** Sen Tang Toilet Powder, Oriental Odor. } *No Samples*

**Sold only at Stores.**

# The Multiplication of Power

There is no higher efficiency in the world than that of the American business man.

The multiplication of *power* in a business man—if he has the ability within him—depends upon the *increased number* of people whom he can, *by personal contact,* interest in his purposes.

He does this by telephone, and the multiplication of *the telephone's* usefulness depends on the *increased number* of persons whom he can reach.

In 1890 the Bell System had 200,000 subscribers' telephones in use. As late as 1899—ten years ago—it had only 500,000.

*To-day it has 4,400,000—one for every twenty persons in this country*—and is increasing at the rate of 500,000 a year.

Has the vast development of industries since 1890—the greatest period of advance in the world's history—*when America has advanced faster than all the rest of the world,* been the force that has built up this great, unified, efficient telephone service; or

Has the increased ability of the American business man to bring people to him from every locality, far and near, *over the Bell Telephone System,* been the cause of the multiplication of his power and his principality?

Whichever the cause and whichever the effect, the advancement of one is inseparably linked with the advancement of the other.

The business man's Bell Telephone, with its long distance and emergency advantages, is his most precious asset next to his capital itself.

***The Bell Long Distance Telephone means as much to the home as it does to the office. It is the most marvelous convenience of modern times—if not all time—added to home life.***

The American Telephone and Telegraph Company
And Associated Companies

***Every Bell Telephone Is a Long Distance Station***

The decisive game in the International Polo match held at Hurlingham, England, July 5

Photographs, Edwin Levick, New York

AMERICA WINS THE INTERNATIONAL POLO CUP IN ENGLAND

The Meadow Brook Polo team, with Harry Payne Whitney as captain, invaded England and regained the American Polo Cup which was carried away by an English team twenty three years ago. The photograph shows Mr. Whitney holding the cup, which has just been presented to him by the Princess of Wales. The match was concluded with the most cordial friendship and good humor on each side

# No Imitator Can Equal The Original 88-Note Apollo

THE MELVILLE CLARK PIANO COMPANY ARE THE ORIGINATORS OF THE 88-NOTE PLAYER PIANO AND THE PIONEERS IN THAT LINE OF INDUSTRY. FOR EIGHT YEARS THE APOLLO PLAYER ENJOYED A MONOPOLY IN THIS FIELD, AND THOUSANDS OF THESE INSTRUMENTS WERE SOLD BEFORE ANY OTHER 88-NOTE PLAYER WAS PUT ON THE MARKET. THE 88-NOTE APOLLO PLAYER PIANO HAS REVOLUTIONIZED THE PLAYER BUSINESS OF THE WORLD, AND NOTHING EVER MADE IN THE PLAYER LINE WILL EQUAL THIS INSTRUMENT. NO 88-NOTE PLAYER PIANO IS ORIGINAL UNLESS THE NAME "APOLLO PIANO" APPEARS ON THE FALLBOARD. ALL OTHER MANUFACTURERS OF 88-NOTE PLAYER PIANOS MUST FOLLOW. THEY CANNOT LEAD.

THE MELVILLE CLARK

# Apollo-Piano

## The Famous Human Touch

**The Marvelous Human Expression of the Apollo Players** is secured by the **DOWNWARD Stroke** of the pneumatic fingers on the piano key in front. This is the **STROKE GIVEN IN MANUAL PLAYING,** and a **GENUINE HUMAN EXPRESSION** is the result.

Other desirable features of the **APOLLO** Players are: **THE ADJUSTING AND TRANSPOSING DEVICE,** by which you can change instantly to five or more different keys by the touch of a finger; the **SELF-ACTING MOTOR,** which regulates the power and distributes it equally, preventing sudden and inartistic changes in tempo by unconscious hard pedaling.

## An Innovation in Player-Pianos

The new **SOLO-APOLLO contains all the superior features of the regular 88-Note APOLLO** and has in addition the **marvelous accenting Device, which brings out the MELODY IN STRONG RELIEF** without impairing the symmetry and power of the accompaniment. Other so-called accenting devices **MERELY GIVE A PROMINENCE** to the theme by subduing the accompaniment. **NO STOPS OR LEVERS ARE REQUIRED TO PRODUCE THE BEAUTIFUL EFFECTS IN THE SOLO-APOLLO**—the merest novice can secure them immediately.

## Cultural Influence of the Apollo Player

The 88-Note **APOLLO** Player-Piano plays the music of the world's greatest composers exactly as written, without mutilation. It thus educates music lovers to the highest ideals. It familiarizes beginners with absolutely correct technique—the most delicate shading and true tone values from the very start. Its influence as a cultural medium in the home is incalculable.

**The Melville Clark Piano, in which the Apollo action is placed, is THE HIGHEST TYPE OF PIANO ARTISTRY**

Write for free illustrated catalogs, explaining all about the Melville Clark **SOLO-APOLLO** and the **APOLLO** Player-Pianos.

**Melville Clark Piano Co., 405 Steinway Bldg., Chicago**

# Down the Trail
# Grand Canyon
## of Arizona

This titanic gash in the earth's crust is a mile deep, many miles wide, 217 miles long, and painted like a sunset.

See the Grand Canyon this season, en route to or from winterless California, on the

## California Limited

Carries a Pullman for the Canyon.

Two to five days' time, $6.50 railroad fare, a reasonable hotel bill at El Tovar (management of Fred Harvey) and a few dollars for rim and trail trips —that's all the extra expense.

Write me for illustrated booklets—"Titan of Chasms," "El Tovar" and "California Limited."

W. J. BLACK, Pass. Traffic Mgr.
A. T. & S. F. Ry. System,
1052 Railway Exchange,
Chicago

# TELEPHONE GROWTH IN CHICAGO

MORE than ten times as many telephones as there were ten years ago is the correct mathematical statement of Chicago telephones to-day. There are now more than 194,000 telephones operated within the city limits. In addition to this number, the Chicago Telephone Company operates more than 52,000 telephones in 110 cities and towns in surrounding suburban territory, all of which are connected with Chicago by direct toll-lines.

The twenty-year ordinance passed by the City of Chicago, and effective December 1, 1907, was enthusiastically received by the populace, and the improvements in the service and the predicted increase in the number of subscribers have been fully realized. The ten-party lines have been superseded by four-party lines at the same minimum guarantee of 5 cents per day. Measured rates have been availed of by thousands of patrons, and out of the grand total only about 10,000 of the old business flat-rate telephones remain.

The local exchange now covers the entire city, and for 5 cents one may talk five minutes, a distance of about twenty-five miles, within the limits of Chicago. The pay-as-you-go, or nickel telephones, have continued in popularity, and there are now more than 100,000 instruments of this type.

The growth in business and the changes required by the ordinance have made great expenditures necessary; new buildings have been erected, new subways and cable systems constructed, and an average of nearly 200 orders for new telephones has been handled for every working day during the past twenty months.

The number of daily telephone calls in Chicago continues to exceed that of any other city, and it is probable that Chicago is the best telephoned of any of the great cities of the world.

Investigations at the time the ordinance was passed developed the fact that there was no village or town within some hundreds of miles of Chicago that did not have direct telephone connection with this city. This is very nearly true now for a distance of one thousand miles, and essentially every city and town east of the Rocky Mountains is connected by long-distance lines. The favorable situation of Chicago for long-distance connection is apparent, as it is approximately the center of this vast area, so that by the shortest lines and consequently at the lowest toll-rates the entire territory may be reached. Chicago business men have not been slow to realize that good telephone facilities mean a saving of time and money to their establishments and that adequate telephones are ideal business-getters. One commercial establishment has 120 telephone lines from its private switchboard to the Chicago Telephone Company's central office; these supply something more than 500 telephones located in the different departments of the establishment. One Chicago hotel has more than 1,400 telephones installed and connected by trunk lines with the Chicago Telephone Company's exchange. Thousands of business places formerly using one line and one telephone now have as many lines as their business requires—from two upward. The telephone is the modern door to business. If many calls come by telephone, a sufficient number of lines must be provided to meet the requirements. It was recently figured that a million messengers could not carry the messages which are transmitted daily in Chicago by telephone, and the end is not yet, for as Chicago grows so grows the telephone which helps Chicago to grow.

# THE WALL STREET OF CHICAGO

THE financial heart of Chicago, which is in La Salle Street between Jackson Boulevard and Washington Street, was appropriately chosen for the cover-design of this issue of THE WORLD To-Day, in honor of the annual convention of the American Bankers' Association, which meets in this city September 13 to 17.

Within four blocks of the central point of this picture there are twenty-eight banking institutions, with capital, surplus and profits aggregating $105,968,202, deposits amounting to $752,723,623, and resources reaching the enormous total of $865,885,414. Several of these banks are among the largest in the United States, and that of course means they are among the largest in the world.

Aside from the organized banks in this great financial center, there are fully fifteen private banking houses which do an extensive business and have resources running into hundreds of millions of dollars. The district also embraces the Chicago Stock Exchange and the Chicago Board of Trade, two of the leading financial and commercial exchanges of the United States, the new City Hall and County Buildings, and the leading theaters.

Flanking the financial district on the west and east are the immense wholesale and retail sections of Chicago which have given the city the title of the Great Central Market, and within a radius of five miles are located the many huge manufacturing plants which have extended the trade of Chicago to the furthermost parts of the earth, and crowned it with the title of the World's Market.

The picture shows two distinct types of architectural adornment—the building of the Northern Trust Company, which was completed and occupied in 1908, and the Hotel La Salle, which will open its doors to the public soon after the first of September, in time for the Bankers' Convention. The completion of the last-named structure will mark a new era in the general attractiveness of the city by making it possible to entertain strangers in a hotel of the highest class, in the very heart of the financial and commercial districts, and the center of Chicago's night life. The La Salle is the largest hotel ever constructed under an original contract, being twenty-four stories in height—twenty-two above and two below the street level—and containing in all 1,172 rooms. The building covers 29,100 square feet of ground, measuring over 178 feet on La Salle by 162½ feet on Madison Street. From the sidewalk to the copper cheneau crowning the roof the building measures 260 feet, and contains 7,500,000 cubic feet. The hotel, with the land on which it is built, represents an investment of over $6,500,000.

Hotel La Salle is fireproof in every sense of the word, and is one of the best examples of the highest type of steel and fireproof construction work. Steel, concrete, Bedford stone, granite, brick, terra cotta, marble and tile are the principal materials in the building. The number of broad stairways and fire-escapes more than complies with the rigid requirements of the Chicago city ordinances.

The steel columns rest on 105 concrete caissons, which are carried 110 feet below the street line to solid rock, making the building one rigid structure from rock to roof.

The location of Hotel La Salle, at the corner of La Salle and Madison Streets, is well chosen. There is no other corner in the city which is so easily or quickly accessible from all railway terminals, and at the same time in such immediate communication with all the centers of activity.

No greater aid to the work of the Association of Commerce in advancing Chicago's interests could be asked for than was the building of this magnificent hotel. Owing to the former paucity of hotel accommodations, the successful efforts of the Association of Commerce in bringing new buyers to the city were to a considerable measure nullified. With the completion of the La Salle, however, this will all be changed. Chicago's guests are now assured of hotel facilities second to none on the American continent.

# BAKER'S
# Breakfast Cocoa

Grinding-room in one of Walter Baker & Co.'s Mills

The special value of the Walter Baker Cocoa lies in the fact that not only is it a perfectly pure article, with a most delicious flavor, made by a scientific blending of the best beans grown in different parts of the world, but it is ground to an extraordinary fineness, being driven in the last stage through a sieve with ten thousand meshes to the square inch, which is the only legitimate way of making it as soluble as possible.

**52** HIGHEST AWARDS IN EUROPE AND AMERICA

## Walter Baker & Co. Ltd.

Established 1780 DORCHESTER, MASS.

# The Baldwin Piano

**The Many Moods in Music**

insure to more people happy, self-forgetting recreation than any other form of entertainment.

Endowed with a tone of infinite variety and imaginative charm, the pleasure of a great and soothing art is trebled by the Baldwin Piano.

Here is that vibrant *mass* of tone ready for the musician's stormier impulses; here, too, the subtler fascination of beautifully colored harmonies; —all things to all natures!

If you have been among the thousands to hear the Baldwin under the singing touch of de Pachmann or Pugno its high artistic qualities are known to you. Only unusual forces commanded by a great organization such as The Baldwin Company could *develop* such qualities.

By any equally able economic policy it is practicable for you to know the Baldwin, though you may live far from the centers where its triumphs have been won. We should like to send you the catalogue. A line to the nearest agent will bring it at once.

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## Short Bosom
# SHIRT

FOR waistcoat days—pleated where it will show—soft and comfortable under the waistcoat. An ideal business shirt. *$1.50*

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CLUETT, PEABODY & CO., 465 River St., Troy, N.Y.

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**For the Scientific and Effective Treatment of**

## CANCER

**Without Resorting to Surgical Procedure**

The only private institution of magnitude in the United States for the exclusive treatment of Cancer and other malignant and benign new growths. Conducted by a physician of standing. Established thirty-two years

*For complete information address*

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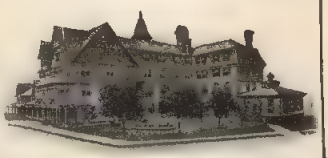

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An ideal health resort, especially attractive during the fall and winter months. Now well equipped with first-class hotels.

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The mineral waters have rapidly gained a reputation as a curative agent for Diabetes, Bright's Disease, Stomach and all forms of Kidney and Bladder Troubles, Insomnia and Headache.

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## IT'S THE OXYGEN

in Calox that renders it so efficient as a cleanser of the mouth and teeth. Just try it.

*Of all Druggists, 25 cents.*

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**Dry Indoor Air**

with its disastrous effects to both body and brain. The

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when filled with water and placed on back of any steam or hot water radiator, keeps the air moist and **prevents Headaches, Colds, Grip and Pneumonia.** Also prevents your furniture, piano, and pictures shrinking and cracking, and house plants from dying. Costs nothing for maintenance, anyone can attach it. Lasts 10 years and daily repays its trifling cost in buoyant health.

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Our new Rose, **Jeanette Heller,** is the ideal garden rose, strong, vigorous and healthy. In color it is a perfect pink, beautiful in bud. **Plan Your Rose Garden Now.** Start with the most vigorous kinds. **Heller's Roses are famous all over America.** Write today for a copy of our new book, **"Roses of the Garden."** It will help you to start right and avoid failure. **It's free.** We pay expressage on all orders.

American Beauty Specialists.

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**Practical Xmas Gift**

Lighting room not interfered with. Heats water to shave while stropping razor; heats curling irons; warms baby's milk in a minute; cooks small lunch or heats a flat iron. Patent smokeless tip—best on the market—given Free. 50c. each, postage prepaid.

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TARRANT'S SELTZER APERIENT

Tastes like Soda Water

**The most agreeable and efficient corrector of**

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**and Biliousness**

It refreshes and invigorates both mind and body.

**50c & $1 at druggists or by mail**

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## Stomach Comfort

**MURRAY'S**

## CHARCOAL TABLETS

**Absolutely unmedicated. Prevent fermentation, absorb all gases, and sweeten the stomach. A bad complexion is wonderfully benefited by their daily use.**

**FOR 10c.** in stamps, a full-size 25c. box mailed for trial. **Once only.**

***A. J. DITMAN, 30 Astor House, N. Y.***

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For 42 years we have been paying our customers the highest natural interest consistent with conservative methods. First mortgage loans of $500 and up which we can recommend after the most thorough personal investigation

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**Holds book correctly while you rest in** healthful positions **sitting** or **lying.** Solid adjustable. Useful present. At bookshops or sent you prepaid $1.50. **Dr. E. S. ANTISDALE, 1023 Jackson Blvd., Chicago, Ill.**

# THE MAINE WOODS

Match your woodcraft and your aim against the game that's worth while.

**Moose and Deer are plentiful this year**

The guides say it will be a big season. Don't be the last one "in."

We'll solve your guide problem if you send a four cent stamp for our **"DIRECTORY OF GUIDES"**

We will also send for that same stamp another sportsman's handbook **"THE FISH AND GAME COUNTRY"**

Address "Sportsmen's Library"
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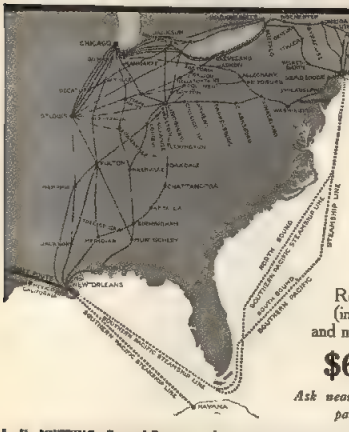
BOSTON AND MAINE RAILROAD

# SOUTHERN PACIFIC STEAMSHIPS

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In connection with rail lines outlined in accompanying map afford a trip of

**"A Hundred Golden Hours at Sea"**

on magnificently appointed steamships and a journey through the middle west on trains of superior equipment.

Journey may commence at most any point.

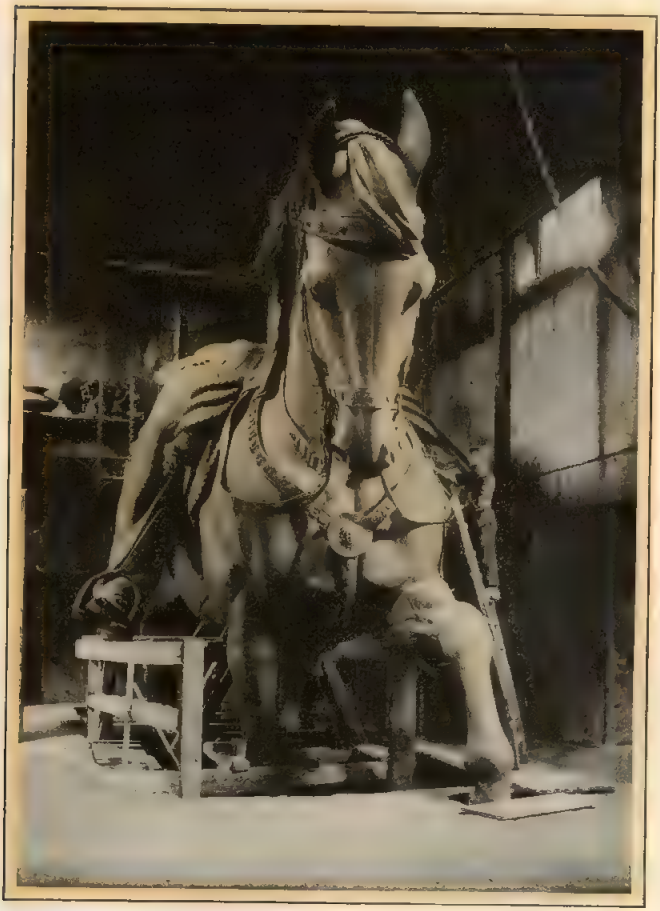
Round trip fare (including berth and meals on ship)

**$63.00**

*Ask nearest Agent for particulars*

L. H. NUTTING, General Passenger Agent, 1158, 366 or 1 Broadway, New York

*The figure of King Victor Emanuel is made of separate bronze castings*



*At work on the colossal bronze horse*

*The sword*

## Perfectly Delicious

A dollar a plate would not buy better tomato soup than Campbell's.

We use only full-grown red-ripe tomatoes, ripened on the vines—luscious, juicy perfect specimens. They are picked at sunrise—when cool and fresh; brought to us direct from the New Jersey gardens—right near our plant; washed five times in running water from artesian wells, and made into soup before noon. That's the story of

# Campbell's Tomato Soup

We not only take out all the skin and seeds but we strain out every trace of the coarse indigestible core-fibre through our huge straining apparatus, built specially for this purpose, with a screen as fine as pin-points. There is no other way to do this important work so thoroughly.

We use only the clear thick juice. And we retain all the fresh natural flavor and aroma. That is why Campbell's Tomato Soup comes steaming to your table so fragrant and spicy, smooth as cream; and with the most delicious smacking relish you ever tasted. And you prepare it in three minutes.

Try it for dinner today. There are many dainty ways to serve it. Some of these are described in Campbell's Menu Book, of which we will gladly send you a copy free if you'll write for it.

For any of Campbell's Soups. They are all made with the same care: all of the same perfect quality.

*If not satisfied the grocer returns your money.*

What better assurance could you ask?

**21 kinds 10c a can**

Tomato, Asparagus, Celery, Julienne, Vegetable, Mock Turtle, Mulligatawny, Clam Bouillon, Chicken Gumbo, Mutton Broth, Consommé, Printanier, Oxtail, Green Pea, Beef, Extra Quality Tomato

Poor little Mabel,
Sent from the table,
Finished the can
And cried for the label.

*Just add hot water, bring to a boil, and serve.*

JOSEPH CAMPBELL COMPANY, Camden, N. J.

**Look for the red-and-white label**

# Remington

AUTOLOADING SHOTGUN

## SOLID-BREECH, HAMMERLESS REPEATING SHOTGUNS

Remington ideas stand out as conspicuously in the gun world as wireless telegraphy and the aeroplane in the world at large. Remington guns lead in modern thought—are apace with progress.

***The Remington Autoloading Shotgun loads itself.*** The recoil ejects the empty shell, throws a loaded one into place and cocks the gun. Your trigger finger controls 5 shots, giving three to get cripples.

***The Remington Pump Gun sets up a new standard.*** Solid Breech does away with a hammer to catch, keeps dirt out of the action and insures safety. If you prefer the pump action, get the up-to-date Remington.

Both guns shoot hard and close, are fine in finish, and handy to handle. They are Solid Breech, Hammerless, absolutely safe *in a class by themselves.*

*If your dealer will not supply you with a Twentieth Century Remington write us*

THE REMINGTON ARMS COMPANY, Ilion, N. Y., U. S. A.
Agency, 315 Broadway, New York City

UMC

## STEEL LINED SHOT SHELLS

*Shoot the Shells with Steel-Protection Around the Smokeless Powder*

STEEL LINED

You get that protection in UMC Arrow and Nitro Club brands which are the only shells made in all America lined with Steel. Yet you pay no more than you do for the unlined makes.

To get shells with Steel Lining, you have to be sure that each box bears the round red UMC trade mark and the words "Steel Lined." It will pay you to look carefully, for the Steel Lining does several very important things:—It keeps out the moisture, protects the gun and the shooter because it makes the shell **stronger** and **safer**; improves the shooting in every way.

You should have no trouble to get UMC Steel Lined Shells as they are sold by over 30,000 dealers But if your dealer cannot supply you, write us and we will arrange for you to be supplied without delay.

*1909 UMC Game Laws and Guide Directory Free*

THE UNION METALLIC CARTRIDGE CO., Bridgeport, Conn.
Agency, 315 Broadway, New York City

THE LATEST RIVER IMPROVEMENTS

This mammoth warehouse stores $40,000,000 worth of merchandise

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SIXTY-SEVEN MILES OF BOULEVARD

Part of a system under the jurisdiction of the park commissioners of Chicago

RECENT IMPROVEMENTS IN THE WEST SIDE PARKS

The illustration shows the refectory in Garfield Park The largest conservatory in the country is in this park

SHERMAN PARK—ONE OF THE NEW CHICAGO PARKS

It has recreation buildings, clubrooms, reading-room, lunchroom, gymnasiums, and shower and plunge baths, a playground and wading and swimming pools. Provision is made for baseball, football, tennis, and boating

# CRYSTAL Domino SUGAR

5lb Sealed Boxes Only! - Best Sugar for Tea and Coffee! - At Grocers Everywhere!

A TOAST TO

# WHITE HOUSE COFFEE

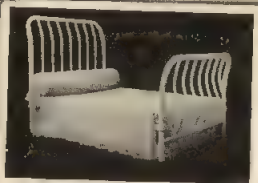
"Here's to the cup that lends to sumptuous repast its chiefest zest.
Without it, not a table---at morn or noon or night---is at its best."

IT SUITS WHEN OTHER COFFEES DISAPPOINT.

White House Coffee is being distributed as fast and as generally as is possible, and it is only a question of time when every worth-while grocer will be able to supply it from stock, on request. In the meantime, if it has not yet reached your grocer, you will be doing him and yourself an injustice if you will consistently suggest that he obtain it for those of his customers who, like yourself, appreciate coffee of the highest character and peculiarly pleasing tastefulness of flavor peculiar alone to "White House."

White House Coffee is packed only in 1, 2 and 3 lb. sealed tin cans and guaranteed to be in perfect condition and genuine if label is unbroken.

DWINELL-WRIGHT CO. PRINCIPAL COFFEE ROASTERS BOSTON-CHICAGO.



*The only make that protects the purchaser with an absolute 10 years guarantee.*

For that New Home—or to make the old one more "comfy"—buy

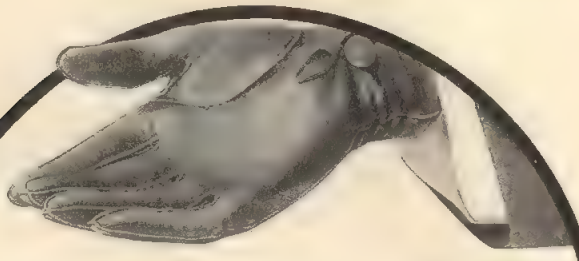
## Sanitaire Beds

*($5 to $25—Absolutely Guaranteed)*

Best for the price; dependable; stand rigid; have ball bearing steel or brass casters, are finished with five and six coats hard enamel; this is why we can give an absolute **ten years guarantee** which means they practically last a lifetime. Original designs by our own designer. Finishes in delicate tints, gold or natural wood. Ask about our springs and babies' cribs.

*Send for our* **Free** *40-page Catalog. Try a Sanitaire Bed* **30 Nights Free.** *Money back if not as represented.*

**Marion Iron & Brass Bed Co.**
652 Sanitaire Ave., - Marion, Ind.



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Fownes Brothers & Co.

Gloves for street wear should combine durability and style; they should be easy and comfortable, yet smart and well-fitting.

# FOWNES GLOVES

on hand this fall will mean glove satisfaction all winter long.

Try a pair of the $2.00 quality, and see what superlative gloves $2.00 will buy. Other grades, $1.50 and $2.50—each the best for the price—and never sold under any other name than Fownes—your guide and your protection.

CONVEX

# STAR CONVEX SAFETY RAZOR

The Superiority of the STAR CONVEX FLEXIBLE BLADE SAFETY RAZOR over all the other thin or wafer blade razors is that it has a guard with no metal obstruction between the cutting edge and the beard which permits a clean, smooth shave, and the convex curve which holds the blade firm produces the diagonal movement or stroke which cuts clean and will not scrape or irritate the skin. Even if the face is sharp or wrinkled the Convex Razor will shave clean, impossible with any other razor. Our FLEXIBLE BLADES are positively uniform in quality, as we take the utmost care in hardening and tempering. They will retain their keenness without stropping longer than any other wafer or thin blade razors on the market.

Catalogue mailed free on request. Sets $2.50 and $3.50.

KAMPFE BROS., 52 Reade Street, New York City

# One Blade Shaved

MR. HIRAM PERCY MAXIM

# Mr. Maxim 151 Times

Inventor of the famous Maxim Silencer, etc., and eminent mechanical engineer, says. "I have shaved with one AutoStrop blade 151 consecutive shaves, and consider that the AutoStrop is the only safety razor which is mechanically perfect and practical."

More about prominent and enthusiastic Auto-Stroppers in our next advertisements.

***A BLADE A YEAR***—Though 151 consecutive shaves sounds unusual, there isn't anything particularly wonderful about it. Any fine razor blade, stropped expertly each shave, will shave you for six months or a year, because you constantly *renew* the edge. An AutoStrop blade is long lived because you constantly renew the edge by automatic stropping. And as for the twelve blades in the AutoStrop set, they will probably last you several years instead of one.

## AutoStrop SAFETY RAZOR Strops Itself

them. That is why the AutoStrop is a strop razor.

You simply slip strop through the AutoStrop Razor (without removing blade or taking apart,) and move back and forth. Blade falls automatically on strop at *exactly* the right angle and right pressure, thus stropping itself expertly. No experience required. No trouble. No time lost. Result? Delicious edge quick! Cost per shave, ¼ to ½ cent; time, 4 to 5 minutes.

No blade trouble. Little blade expense. A wipe and it's clean and dry. Nothing to unscrew and screw up again.

Consists of heavily silver-plated holder, 12 blades and strop, in small, handsome leather case, size only 2x4 in. Price $5.00, which is probably the total cost of your shaving for years.

Get one and try it. You'll be glad you did. Like Mr. Maxim you'll say it's the only *practical* safety razor.

***THE WHOLE AUTO STROP IDEA***—Your friends who shave themselves with old-fashioned razors don't have their razors honed more than once or twice per year. The AutoStrop Safety Razor is simply the same edge that your old-fashioned friend or head barber uses, only it is constructed ingeniously so that a novice can strop it as expertly as the head barber, and so that a novice can shave with it as expertly as the head barber, and can't cut himself. That is all you want a razor to do, is it not?

***TO GET HEAD BARBER SHAVES***—you must strop your blades. No other way to get

***GET ONE AND TRY IT FREE.***—for thirty days. If you don't like it, get your $5.00 refunded. If your retailer doesn't sell the AutoStrop on thirty days' free trial, we will. Every buyer must be satisfied with his AutoStrop or with his money back. Get an Auto Strop while you have it in mind.

***A BOOK YOU WANT.***—If your shaving is too satisfactory, you don't want it, but if it isn't, this book will keep you up late. It's a quick, speedy, witty, instructive, interesting conversation, entitled: "An Interview With the Greatest Razor Expert." Write us before you forget.

AUTOSTROP SAFETY RAZOR COMPANY
343 Fifth Ave., NEW YORK
14 St. Helen Street, Montreal
61 New Oxford St., London

# A Gillette Safety Razor

## That Fits in Your Waistcoat Pocket

A GREAT welcome has been given our New Pocket Edition — men everywhere are talking about it — thousands of them are buying it.

Live dealers everywhere are showing it.

The man who does not use the GILLETTE probably has no conception of its tremendous vogue or the enthusiasm of its users.

If you were to put down the names of the fifty leading Americans in public and private life, the majority of them would be GILLETTE users.

It is the policy of the GILLETTE Company never to use testimonials, nor to print the names of its customers.

Yet they could arrange a list of GILLETTE patrons that would read like "Who's Who in America"—besides some world-famous names and a few crowned heads in other countries.

We mention these facts merely to show that it is not economy alone, but convenience, that counts most with the men who use the GILLETTE. They respect it as a remarkable invention. It meets a world-old necessity in a new and better way.

The pocket-case is made in gold, silver or gun-metal. Plain polished or richly engraved. Handle and blade box each triple silver-plated or 14 K. gold-plated — *the blades are fine.* Prices, $5.00 to $7.50; on sale everywhere.

You should know GILLETTE Shaving Brush — a new brush of GILLETTE quality—bristles gripped in hard rubber, and GILLETTE Shaving Stick — a shaving soap worthy of the GILLETTE Safety Razor.

GILLETTE SALES CO.

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Gillette Safety Razor

# The World's Best Books and Globe-Wernicke Bookcases

The widespread use of books for Christmas gifts has prompted us to publish lists of the 5, 10, 25, 50 and 100 "best books," for children and adults, as selected by such authorities as Hamilton W. Mabie, John Ruskin, Canon Farrar, Dr. Eliot, Sir John Lubbock, etc. Sent free on request.

For Christmas gifts **Globe-Wernicke** Bookcases are most acceptable. They are built in sections or units, that interlock and can be built up into stacks of any desired height or width. You can start with one or more units, and add to them as your books increase.

# Globe-Wernicke Elastic Bookcases

have many special features of superiority, such as the ***patent equalizer*** to prevent doors from binding and the ***interlocking strip*** to insure true alignment. ***Uniform prices*** and ***freight prepaid*** everywhere.

Look for the **Globe-Wernicke** trade-mark. It is your guarantee of quality—your protection against inferiority—your assurance of being able to obtain duplicates at any future time.

*Write for Handsomely Illustrated Catalogue*

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***Fill out and mail this coupon today***

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Mail to the address below lists of "The World's Best Books" and your illustrated catalogue of **Globe-Wernicke** Bookcases.

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# Christmas Candy—all the fun of making it at home and a sure success if you use Karo—the great candy syrup. Karo fudge, taffy, caramels, pop-corn balls are famous. You can eat them more freely than other sweets—they are wholesome and digestible.

**Eat it on**

**Griddle Cakes**
**Hot Biscuit**
**Waffles**

**Karo**
**CORN SYRUP**

**Use it for**

**Ginger-Bread**
**Cookies**
**Candy**

Karo is delicious on buckwheat cakes.—It is the best and purest syrup in the world for all table uses, for cooking and home candy-making. It agrees with everybody. As a spread for bread, you can give the children all they want.

***Send your name on a post card for Karo Cook Book —fifty pages *including* thirty *perfect* recipes for home candy-making.**

CORN PRODUCTS REFINING CO., Dept.D,D,New York

# HAMBURG AMERICAN CRUISES

Embody the fruits of many years experience. Our fleet of superb twin-screw cruising steamers are equipped with every convenience of modern travel. Our itineraries are selected and planned with a view toward meeting every possible demand and suiting every purse.

The program for the coming winter includes

## FIRST GRAND CRUISE

by the

## S.S. BLUECHER

Leaving New York, January 22, 1910, Lasting 80 days—costing $350 and up.

TO

# SOUTH AMERICA

A GRAND ORIENT CRUISE by the new S. S. CINCINNATI from New York, January 29, 1910.

80 DAYS—$325 UP (including landing and embarking expenses)

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3 CRUISES by the superb twin-screw S. S. OCEANA, 2 of 31 days —one of 16 days, during January February and March.

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Also other Cruises and Tours to the Mediterranean, Adriatic and Caribbean Seas

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*Registered Trade Mark*

*Established Half a Century*

# Handkerchiefs

## At "The Linen Store"

A mere mention of the Handkerchief Department of "The Linen Store" will suggest to those who are familiar with it a comprehensiveness of styles, sizes and designs that is unequaled elsewhere—a roomy, comfortable place to shop, together with efficient, intelligent service.

At no time during our 50 years of Handkerchief selling have we offered a wider variety or more attractive styles. The assortment includes:

**Madeira Handkerchiefs** at 50c, 75c, $1.00, 2.00 and up to 3.50 each
**Armenian Handkerchiefs,** 50c, 75c, $1.00, and 1.50 each.
**Embroidered Handkerchiefs,** 25c, 50c, $1.00, 2.00 and up to $100 each.
**Plain Hemstitched Handkerchiefs,** for men and women, 12½c, 25c, 50c, $1.00, up to 4.00 each.
**Real Lace Handkerchiefs,** $2.50, 3.00, 4.00, 5.00, 10.00 and up to $100 each

### Handkerchiefs for Christmas.

Even at this early date we direct attention to the fact that Christmas Handkerchiefs can now be selected to the very best advantage. It is especially important that orders which include the embroidery of Monograms and Initials be placed at once.

*Mail Orders receive our prompt attention.*

**James McCutcheon & Co.,** **5th Avenue & 34th St., N. Y.**
Opposite Waldorf-Astoria

# Brighton Garters in Christmas Boxes

From now until the holiday period you can get the famous Brighton Flat Clasp Garters in handsome Christmas Boxes, specially designed and decorated for the gift season. No extra charge. At dealers, 25c or we will mail them direct.

**PIONEER SUSPENDER COMPANY**
**718 Market Street, Philadelphia**

# CHRISTMAS *Bull Dog* SUSPENDERS

**IN SINGLE PAIR BOXES 50¢**

## Why not buy him a pair of Bull Dog Suspenders for Christmas in a beautiful gift box?

The city business man who receives Christmas morning a pair of hand-knitted stockings from his grandmother in the country is no worse off than thousands of other men. For while all remembrances prompted by affection are deservedly acknowledged, it's the practical, service-giving gifts which a man really appreciates.

This explains why every year, as the holiday season approaches, there is an enormous demand for **Bull Dog Suspenders** in handsome embossed single pair boxes.

## A Seasonable Suggestion

Order a few boxes from your dealer to-day (there was not enough to go around last year) and have them ready to put on the tree. They will please father, brother, nephew, or sweetheart, and their pleasure lasts because **Bull Dogs** are so durable and satisfactory.

## *They outwear three ordinary kinds*

**Christmas Bull Dogs** come in many beautiful colors and designs, with leather ends to match and gold gilt metal trimmings; light or heavy weight and extra long at same price

**A Sensible, Pleasing and Inexpensive Gift for 50 cents**

**Refuse substitutes. Look for BULL DOG on the buckle and box—50 cents at your dealer's or by mail, postpaid, if he will not supply you.**

HEWES & POTTER,

**Dept. 10 87 Lincoln Street, Boston, Mass.**

*Largest Makers of Suspenders in the World*

Copyright 1909
by Hart Schaffner & Marx

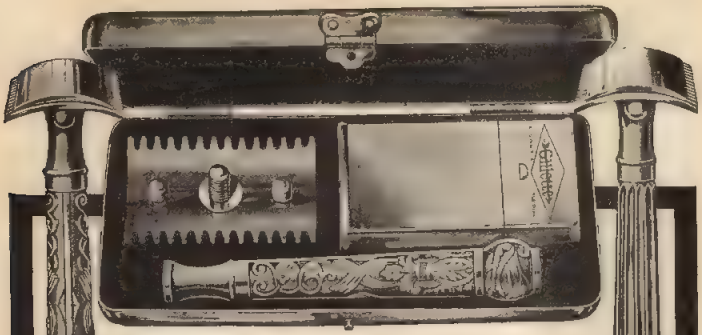
IF you care to be sure, in buying clothes, that you're getting correct style, all-wool fabrics, and the kind of tailoring that ought to go with these things, and with you, be sure you see our mark in the garments.

It's a small thing to look for, a big thing to find. Send six cents for the Style Book.

Hart Schaffner & Marx

Good Clothes Makers

Chicago Boston New York



# Gillette Safety Razor

NO matter how skillful a man may be with an ordinary razor he will occasionally nick his face—and there is always the danger of a ***bad cut.***

The Gillette is safe. On some mornings a man is nervous or in a hurry and there are times when "his fingers are all thumbs" -then there's special comfort in the Gillette. It requires no stropping or honing. He can shave quickly—clean up all the corners without a cut or scratch.

The time to buy a Gillette is now.

It pays for itself in three months and it lasts a lifetime.

The Gillette, illustrated herewith (actual size), is so compact that it can be carried in the pocket or slipped in the side of a traveling bag. It comes in gold, silver or gun metal—with handle and blade box to match. *The blades are fine.*

Prices, $5.00 to $7.50. For sale everywhere.

You should know Gillette Shaving Brush—bristles gripped in hard rubber: and Gillette Shaving Stick a soap worthy of the Gillette Safety Razor.

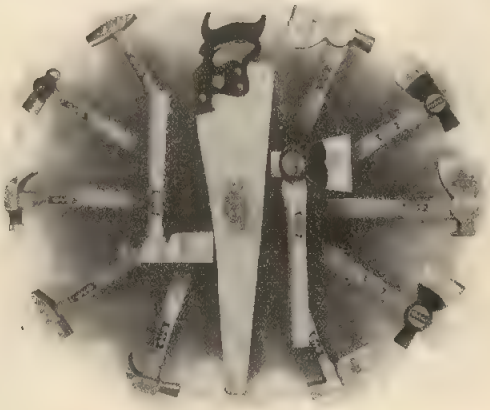
New York, Times Bldg.
Chicago, Stock Exchange Bldg.
London Office
17 Holborn Viaduct

GILLETTE SALES CO.
564 Kimball Building, Boston

Canadian Office
63 St. Alexander St
Montreal

Factories: Boston, Montreal, London, Berlin, Paris

# THOUSANDS!



Thousands of different articles in ***Tools, Cutlery*** and ***Hardware*** bear this brand of superior excellence.

Whether it be a tool, pocket-knife, pair of shears, carver or article of silver-plated ware, the brand **OVB** signifies the highest obtainable quality. The purchaser is doubly protected, as we stand behind the dealer in guaranteeing all such articles. Ask for **OVB** and insist upon it.

**HIBBARD, SPENCER, BARTLETT & CO.**
STATE STREET BRIDGE
CHICAGO.
ESTABLISHED 1855

Copyright 1900
By Hart Schaffner & Marx

MAKE up your mind now that you are going to wear Hart Schaffner & Marx clothes this fall: For the certainty of being dressed in correct style; for the assurance of all-wool fabrics, when cotton-mixtures are the rule; for shape-keeping, high-grade tailoring; for real economy.

If your clothier offers something else, there's probably more in it for him than for you. No clothier will offer you better clothes than ours; every dollar they cost is in the goods. In these days of advancing prices of wool and of fabrics, the temptations to cheapen quality are strong, you'll find many lower-priced clothes; but none really equal in value.

Our mark in clothes is a small thing to look for; but it's worth insisting on, because it's a big thing to find. Send six cents for the fall Style Book, 32 pages, 25 handsome style illustrations.

Hart Schaffner & Marx

Good Clothes Makers

Chicago Boston New York

Copyright 1909 by Hart Schaffner & Marx

YOU understand, of course, that our object in these illustrations is to lead you to want to see the clothes, and find out if they're as good as they look here.

But when you see them, don't let one point escape you; our fabrics are always, without exception, strictly all-wool; it's really the most important point, for you. There's a good deal of clothing for sale that isn't all-wool; better be sure of our name in what you buy.

Send six cents for the Spring Style Book; shows a lot of good ones.

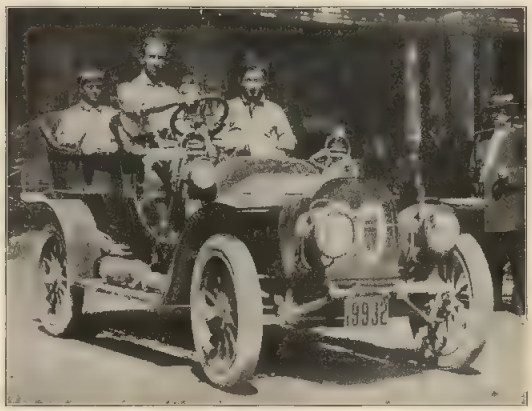
Hart Schaffner & Marx

Good Clothes Makers

Chicago Boston New York

42 42

# HAYNES




## Winners of 42 Perfect Scores

IN ENDURANCE AND SEALED BONNET
RELIABILITY CONTESTS

HAYNES AUTOMOBILE COMPANY
KOKOMO, IND.

*CHICAGO BRANCH*
*1702 Michigan Avenue*

*NEW YORK BRANCH*
*1715 Broadway*

42 42

# Over
# $306,000,000.
## New Life Insurance

**Written and Paid for in 1908!**

## The Most Remarkable Year

**In the History of**

# The Prudential

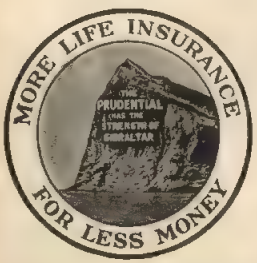
**This Magnificent Record is Due to**

**Public Appreciation of the NEW "Low-Cost" Ordinary Policy, the New Industrial Policy and the New Monthly Income Policy—All Meeting the Demand for**

## Guaranteed Life Insurance

**and**

**It also shows Popular Approval of the Administration, Strength, Liberality and Fair Dealing of the Company.**




**Send us your age and we will tell you what The Prudential will do for YOU in Life Insurance.**

**The Prudential Insurance Company of America**

Incorporated as a Stock Company by the State of New Jersey.

JOHN F. DRYDEN, Prest. Dept. 87. Home Office, Newark, N. J.

# The Howard Brush Company

For more than Twenty years has devoted its attention to the manufacture of GOOD HAIR BRUSHES.

Each year has shown a steady gain in quality and an addition to our list of appreciative customers.

We can make the cheap kind which are about as good as a towel for the purpose of brushing the hair, but as we believe each brush sold will secure a new friend if it is intelligently constructed, we have worked toward the goal of securing the reputation of making the BEST HAIR BRUSH IN THE WORLD.

You will agree with us in the above statement if you will examine the brushes. The best stores carry our brushes finished in the Beautiful Turtle Ebony as well as with Pure Silver Backs as shown here. Ask to see the

*Howard* BRUSHES

**Godiva** **Ajax**

**and**

**Samson** **Military**

These brushes with the beautifully engraved

**Pure Silver Backs**

are the finest made and have just been placed on the market.

Before buying a brush don't fail to see the Howard Brushes, and if your merchant cannot show them or supply you we shall greatly appreciate it if you will write us so that we may arrange to have you properly served.

**The Howard Brush Co., 15 West 24th St., New York**

# The Howard Watch

THE finest compliment you can pay a man is to give him a HOWARD watch.

It shows that in your opinion the best is not too good for him.

It classes him among men with whom punctuality and exactness are a principle—as a HOWARD sort of man.

He knows the HOWARD is the finest practical timepiece in the world. He appreciates your decision as to quality.

He values the HOWARD for its associations—as the chosen timepiece of the men who have done the big things in this Nation for three generations.

Moreover, it is an intimate sort of gift; something that is always with him and which must often suggest the giver.

A HOWARD watch is always worth what you pay for it.

The price of each HOWARD from the 17-jewel in a fine gold-filled case (guaranteed for 25 years) at $35.00; to the 23-jewel in a 14-k. solid gold case at $150.00—is fixed at the factory, and a printed ticket attached.

Drop us a postal card, Dept. X, and we will send you a HOWARD book of value to the watch buyer.

**E. HOWARD WATCH COMPANY**
BOSTON, MASS.

A PURE SOAP IN THE WORLD'S SOAP BOX.

Webster's Dictionary defines "purity" as "the condition of being pure."

Pure is defined as "free from that which harms, vitiates, weakens or pollutes; genuine; real."

This definition fits Ivory Soap exactly. It is "free from that which harms, vitiates, weakens or pollutes." It is genuine. It is real.

Twenty years ago, pretty nearly everybody looked upon Ivory Soap as merely a bath and fine laundry soap.

They do so no longer.

Intelligent men and women, all over the country, have awakened to the fact that purity is more important than perfume. And they use Ivory Soap for the toilet, as well as for the bath, not because it is cheap, but because it is pure.

Can you think of a better reason?

Ivory Soap . . . . 99 44/100 Per Cent. Pure.

NOTE With a stout thread, it is a very easy matter to cut a cake of Ivory Soap into two cakes of convenient size for toilet use.

Copyright 1909 by Hart Schaffner & Marx

BETTER be sure your thin summer clothes are of all-wool fabrics if you want them to hold shape and style.

Our mark is the sign, a small thing to look for, a big thing to find  Send for Spring Style Book, six cents.

Hart Schaffner & Marx Good Clothes Makers

Chicago  Boston  New York

The uses of Ivory Soap are extraordinarily varied.

It is, as almost everybody knows, the best—because the purest—of bath, toilet and *fine* laundry soaps.

Because of its purity, it can be used for a great many purposes for which ordinary soaps are unsafe and unsatisfactory.

One use of Ivory Soap, with which comparatively few people are familiar, is in connection with flowers.

*Ivory Soap will keep them clean.*
*It will keep them healthy.*
*It will rid them of all sorts of plant pests.*

Professional florists use Ivory Soap in preference to anything else. They like it because it is harmless, effective, easily applied and leaves no disagreeable odor behind it.

DIRECTIONS Shave a cake of Ivory Soap very thin and dissolve it in two quarts of boiling water. When dissolved, add cold water and use at once. The amount of cold water which you should add depends upon what you intend to use the solution for. If for roses, carnations, violets, chrysanthemums and plants with leaves of a similar texture, add 8 gallons. The syringe and should be sprayed on, care being taken to see that it reaches the under side of the leaves. Rinse with clear, soft water half an hour after applying. In small plantings use a sixth of a cake of Ivory Soap, dissolved in a pint of boiling water, and add one and a half gallons of cold water.

For begonias, ferns and all tender and hairy plants add 16 gallons of cold water. Dip plants in this or spray it over them. Rinse with clear soft water. In small quantities, use a sixth of a cake of Ivory Soap, dissolved in a pint of boiling water. Add two gallons of cold water.

# Ivory Soap – 99 44/100 Per Cent. Pure.

*These directions appeared in the magazines of June, 1907, and are now reprinted by request*

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Our mark is the sign, a small thing to look for, a big thing to find  Send for Spring Style Book, six cents.

Hart Schaffner & Marx Good Clothes Makers

Chicago  Boston  New York

# JAP-A-LAC

RENEWS EVERYTHING

"WEARS LIKE IRON"

## DONT THROW IT AWAY

unless it is damaged beyond repair. With a can of JAP-A-LAC you will enjoy being your own "handy man." Furniture which has become scuffed or scratched, Window Casings, Doors and Floors that are dull and depressing, Mantels, Fireboards, Chandeliers, Picture Frames and all the little furnishings that begin to show the effects of time and use

ALL YIELD TO THE MAGIC OF JAP-A-LAC.

JAP-A-LAC is the hardest, most durable and lustrous colored varnish made. Applied according to directions it "sets" hard as adamant, with a mirror-like surface and "wears like iron." Does not show white marks when scratched or scuffed as ordinary varnishes and imitations do, and is impervious alike to extremes of climatic temperature and moisture.

JAP-A-LAC is the best colored varnish and has never been even nearly equaled by the many imitations to succeed it has brought out

It is made from selected raw materials, which are prepared and imported direct to insure unvarying quality.

JAP-A-LAC is made in sixteen beautiful colors for refinishing every kind of Woodwork, Bric-a-brac, Chandeliers, Floors, Furniture and every painted or varnished surface.

JAP-A-LAC has no substitute

FOR SALE BY PAINT, HARDWARE AND DRUG DEALERS.

If your dealer does not keep JAP-A-LAC send us his name, with 10 cents to cover cost of mailing, and we will send a free sample quarter-pint can of any color (except gold, which is 25 cents) to any point in the United States.

Write for illustrated booklet containing interesting information and beautiful color card. Free on request.

The Glidden Varnish Co.

Our Green Label Line of clear varnishes is the highest quality manufactured. Its use insures perfect results. Ask your paint dealer.

2695 ROCKEFELLER BUILDING, CLEVELAND, OHIO, U. S. A.

JAP-A-LAC Model Floor Graining Process solves the problem of "What shall I do with my old carpeted Floor to make it sanitary and refined?" Your Painter can do it at a little expense, or you can do it yourself. Insist on JAP-A-LAC.

**We Invite Correspondence**

from all who are in any way interested in building. We want to tell them the advantages of plastering with

## Climax Wood Mortar on Sackett Plaster Board

—why it is superior to the old style lime mortar—why it is more economical and does not get out of repair.

TRADE G.R.P. QUALITY MARK

"Climax Wood Mortar" is one of the "G. R. P. Quality" brands of plaster. It is made of pure Gypsum Rock and a finely cut wood fibre. It is light, dries quickly and is easy to apply.

"Sackett Plaster Board" is a composition of alternate layers of felt paper and stucco. It is far better than lath—saves fuel and does away with lath stains—when used in combination with our Climax Wood Mortar offers wonderful fire protection. Ask us about it.

**Grand Rapids Plaster Company, Grand Rapids, Mich.**

Climax Wood Mortar Makers of Hercules Wall Plaster
Superior Wood Fibre Plaster Gypsum Wall Plaster
Sales Agents for Sackett Plaster Board

*For sale by all dealers in builder's supplies*



GET ready now for outdoor sketching; overhaul your equipment; see that your box is in order, and get in your stock of Devoe colors, brushes, canvas and other necessary supplies.

You'll never get better quality than Devoe, the standard of excellence in all such materials.

We'll fit you out completely with all you need; easels, stools, umbrellas, and all the rest. Devoe quality pays. Address Department D.

# Devoe

176 Randolph Street - - - Chicago
Fulton and William Streets - New York
1214 Grand Avenue - - Kansas City

"A Kalamazoo Direct to You"
TRADE MARK REGISTERED

# Cash or Credit

## Take Your Choice

**May We Quote Our Factory Price On "A Kalamazoo Direct to You"**

WE want to save you 30 cents on every dollar of your stove money. Selling and shipping direct from our Factory to you at Factory price, makes your stove or range cost you at least 30 cents on the dollar less than you would have to pay a dealer anywhere for a stove or range of quality equal to "A Kalamazoo Direct to You."

Perhaps we can save you *more*. It depends on the style of range or stove you choose. We have proven the saving to thousands of stove buyers throughout the United States. But the saving of the money isn't all. We will give you a more satisfactory stove or range than you can possibly buy from anyone, anywhere.

We've been in the stove manufacturing business too long—and our square dealing is too well known to make these statements if we couldn't prove them.

## Just The Stove You Want For Cash Or Credit

Our Selling Plan heretofore has been for cash—but we know there are thousands of responsible people who would like to take advantage of our money-saving prices, but as a matter of convenience to them, for the time being, they want to buy on a charge account.

We want your order—whether you are a cash buyer or whether you want to buy on credit—consequently we will give you your choice. Responsible people can buy a "Kalamazoo Direct to You" on either plan. Suit your own convenience—and make the saving which our factory price to you direct enables you to make.

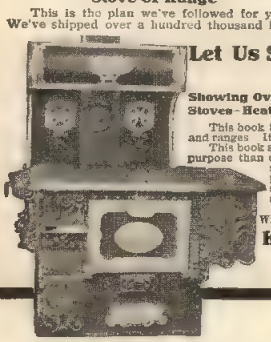
### 360 Days' Approval Test On Your Stove Or Range

This is the plan we've followed for years. We've shipped over a hundred thousand Kalamazoo Stoves and Ranges direct from factory to users on 360 Days' Approval Test. It is a long test If any range or stove that we sell does not prove to be exactly as we represent it to be in every detail, during the 360 Days, then we'll take it back and refund all of the money you have paid us. No other range or stove manufacturer in the United States makes this liberal offer.

### We Pay all Freight Charges and Guarantee Safe Delivery

Our Stoves and Ranges are all priced delivered at your station—all charges prepaid.

You know exactly what you've got to pay for your stove when you order from us and there will be no freight charges to pay when the stove arrives—thus you can tell immediately just how much you save.



## Let Us Send You Our Big Free Factory Stove Book

**Showing Over 300 Different Styles and Prices of Ranges—Cook Stoves—Heating Stoves and Gas Ranges. Ask for Catalogue No. 309**

This book fully explains our selling plan and our complete line of stoves and ranges It will be sent you postage paid and is our only salesman.

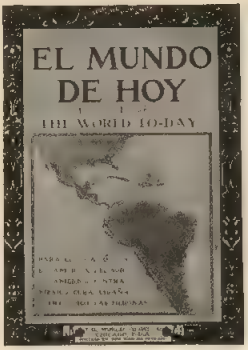
This book shows you more styles and sizes of stoves and ranges for every purpose than could be found at any dealers. It tells you just how a good stove should be made—And how our direct-from-factory-to-you plan saves money for you. In writing, mention kind, style and size of stove you want. Please write for the book today. Just a postal will bring it.

Wm. Thompson, V.-P. & Gen. Mgr.

**Kalamazoo Stove Company**

**Kalamazoo, Mich.**

Gem Thermometer




# The Best Advertising Medium

to reach Latin America—Mexico, Cuba, Puerto Rico and South America—is

# El Mundo De Hoy

The success of EL MUNDO DE HOY is evidenced by the class of advertisers using it. The following are some of its patrons:

Allis-Chalmers Co.
Studebaker Bros. & Co.
Monarch Typewriter Co.
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Dentacura Co.
Appleton Car-Mover Co.
American Well Works.
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Gerhard Mennen Co.
Thomas B. Jeffery & Co.
Johnson's Floor Wax
G. W. Sheldon & Co.
W. R. Grace & Co.
United Fruit Co.
Fox Typewriter Co.
Ohio Electric Works
The Fred W. Wolf Co.
H. J. Heinz Company
American Bank Note Co.
Farrand Organ Co.
National Machine & Stamping Co.
A. C. McClurg & Co.
Stolz Electrophone Co.
Commercial Cor. School
Challenge Company
Collins Plow Co.
Zenner Disinfectant Co.

The Latin-American Export trade offers great possibilities to the American Manufacturer. Millions of dollars now diverted to Europe can be ours with very little effort.

EL MUNDO DE HOY offers exceptional opportunities to reach importers under the most favorable conditions.

## 10,000 Guaranteed Circulation

Do you realize that this means covering almost completely the entire business and professional interests of Latin America?

EL MUNDO DE HOY, the only standard magazine printed in Spanish and circulating in Latin America for the purpose of exploiting the United States, its markets and the quality of its products, offers you exceptional opportunities to extend your foreign trade into a lucrative field.

If you are a manufacturer seeking foreign markets we shall be glad to send you free of charge "Latin America: A great Commercial Opportunity," by Hon. John Barrett. This is an illustrated booklet containing much valuable information.

EL MUNDO DE HOY is published quarterly — February, May, August, November. Copy is now being received for May.

Don't you want some of this trade? We will be glad to tell you more about it. Address

**THE WORLD TO-DAY COMPANY**

NEW YORK OFFICE: 156 Fifth Avenue — CHICAGO OFFICE: 87 Wabash Avenue

# Maillard's

## A Place of Interest in New York

THE most famous Luncheon Restaurant of all, wherein are served the choice dainties for which the name of "MAILLARD" has been renowned for over 60 years. The decorations, furnishing, appointments and service are unsurpassed. The situation is absolutely central.

*Fifth Avenue and Thirty Fifth Street*

*VISITORS TO THE HUDSON-FULTON CELEBRATION*

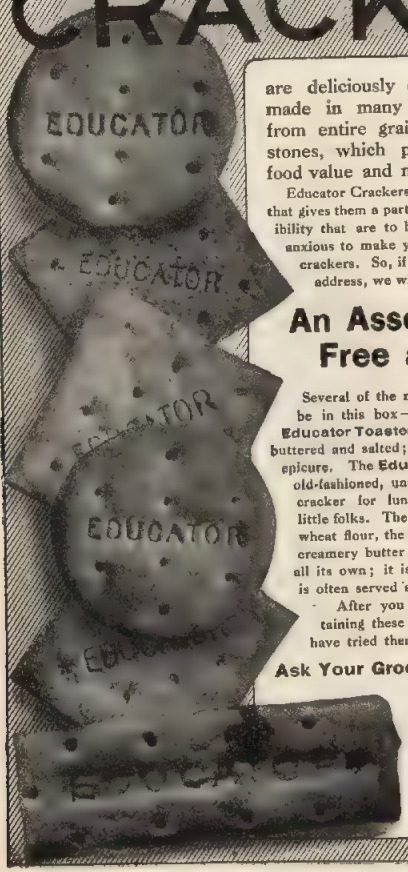
can secure, in the adjoining palatial Bonbon store, as charming Souvenirs and reminders of the occasion, MAILLARD'S Imported Bonbonnieres Parisienne—Sevres, Porcelain, Hand-painted Satin Boxes, etc.; with endless varieties of MAILLARD'S delicious chocolates and confections—an exhibit without an equal.

MAILLARD'S BREAKFAST COCOA AND VANILLA CHOCOLATE. Their points of superiority are due to the use of the finest selected beans, and to MAILLARD'S exclusive process of manufacture.

**Afternoon Tea From 3 to 6**

*Fifth Avenue and Thirty Fifth Street, New York*

# EDUCATOR CRACKERS




are deliciously crisp and dainty and are made in many different varieties, but all from entire grains, freshly milled between stones, which preserves the full, natural food value and nut-like flavor of the cereals.

Educator Crackers are baked by our exclusive method that gives them a particular crispness, delicacy and digestibility that are to be had in no other cracker. We are anxious to make you acquainted with these delightful crackers. So, if you will forward us your name and address, we will send you

## An Assorted Box Sent Free and Postpaid

Several of the most popular kinds of Educators will be in this box—among them you will find: The **Educator Toasterette**, an entire-wheat wafer, toasted, buttered and salted; a cracker that is a revelation to the epicure. The **Educator Graham Cracker**, a "real" old-fashioned, unsweetened graham cracker, just the cracker for lunch time; especially good for the little folks. The **Fruited Educator**, made of entire-wheat flour, the finest Carabuna raisins and the best creamery butter; a cracker that possesses a charm all its own; it is unsurpassed for the afternoon tea, is often served as a dessert.

After you have received the sample box containing these and other popular Educators, and have tried them,

**Ask Your Grocer for Educator Crackers**

Then you'll be certain not to accept a substitute. If your grocer hasn't Educators and won't get them for you, order direct from us.

But be sure to send for this sample package today and also send your grocer's name (if you please) so he'll be sure to have Educators when you want them.

**Johnson Educator Food Co.**
**219 Tremont Street**
**Boston, Mass.**

# In any kind of Weather

## The Marlin

## No 24-12 Repeating Shotgun

does perfect work. It has the simplest and strongest repeating mechanism. It can't freeze or clog up in service, for the solid top and closed in breech keep out rain and all other foreign matter.

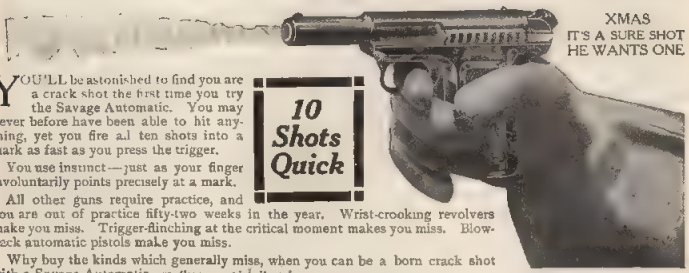
The automatic, recoil-operated hang-fire safety lock, the side ejection and double extractors are further features of safety and convenience. The full choke guns shoot close and hard, and are unequalled for ducks, geese, foxes and all long-range work.

The new take-down construction is very simple, quick and efficient. You can take the gun apart in 10 seconds anywhere, yet the threads of barrel and frame are not cut away or weakened and the joint is always as strong and rigid as in a solid gun.

Illustrated circular of this handsome, new gun sent free on request, or complete 136-page catalog for 3 stamps postage

*The Marlin Firearms Co.*,
16 Willow St. NEW HAVEN CONN

# You Are a Born Crack Shot



XMAS
IT'S A SURE SHOT
HE WANTS ONE

YOU'LL be astonished to find you are a crack shot the first time you try the Savage Automatic. You may never before have been able to hit anything, yet you fire all ten shots into a mark as fast as you press the trigger.

**10 Shots Quick**

You use instinct—just as your finger involuntarily points precisely at a mark.

All other guns require practice, and you are out of practice fifty-two weeks in the year. Wrist-crooking revolvers make you miss. Trigger-flinching at the critical moment makes you miss. Blow-back automatic pistols make you miss.

Why buy the kinds which generally miss, when you can be a born crack shot with a Savage Automatic *any time you pick it up!*

The Savage is the only Automatic that ***shoots straight.*** Simply because all automatic action is suspended at each shot until the bullet is out!

Safe to carry as a watch. Light (19 oz); short (6½ in.); Powerful (.32 cal.). Uses standard ammunition. Your dealer's. If he hasn't it, you can buy it from us.

We have decided to give away another edition of "The Tenderfoot's Turn," by "Bat" Masterson, former Government scout and sheriff at Dodge City. Explains how the crack shots of the Southwest Trail won their fame. Send for a copy of

"BAT" MASTERSON'S BOOK FREE

**THE SAVAGE RIFLES**

With our new factory additions we can now meet the demand for high power (.99 model) repeaters (.303). No more delays and disappointments. Ask dealer to show our .303 Repeater and 22 cal. Repeater. Handsomely illustrated catalog—full of rifle information free. Use a postcard. Send now to Savage Arms Company, 8712 Savage Avenue, Utica, New York.

# The New SAVAGE Automatic

Rexall
"93" HAIR TONIC
Two sizes, 50c. and $1.00
Invigorates the Scalp-Nourishes the Hair Roots
Your Money Back if it Doesn't
Sold and guaranteed by Only One Druggist in a place. Look for The Rexall Store.
They are in over 2500 towns and cities in the United States.
UNITED DRUG COMPANY, 47 LEON STREET, BOSTON, MASS.

**NABISCO** Cream Cones

Made with

# NABISCO
## SUGAR WAFERS

As an adjunct to the social hour; as a delightful accompaniment to ices or beverages, no other dessert confection has ever proved so charming as Nabisco. As an example, serve Cream Cones made with Nabisco Sugar Wafers.

**RECIPE**

*Materials*—One box Nabisco Sugar Wafers—any flavor. One cup sugar, one-fourth cup water, one teaspoon of vinegar, one egg white, one cup double cream.

*To Prepare*—Place sugar in sauce pan. Add water and vinegar, boil to soft ball stage. Beat egg white until stiff and gradually add the hot syrup. Beat until stiff. Cover edges of Nabisco Wafers with this icing and form into cones, using three to each cone. Whip cream until stiff and when cones are cold fill and serve.

***In ten cent tins***

Also in twenty-five cent tins.

NATIONAL BISCUIT COMPANY

# Home Builders

When you equip your home see that the bath tubs you buy are guaranteed. The *"Standard" Green* and *Gold Label Bath* carries a *Five-Year Guarantee Label* and the *"Standard" Red* and *Black Label Bath* carries a *two-year guarantee label.*

The guaranteeing of *"Standard"* Green and Gold Label Baths for *five years* and the *"Standard"* Red and Black Label Baths for *two years* against defects in either material or workmanship is the most important departure ever instituted in the sale of sanitary bathroom fixtures.

Because of their sanitary efficiency, durability and beauty, *"Standard"* baths are the most widely known and used in the world. Because of this unprecedented popularity of genuine *"Standard"* goods unscrupulous dealers have substituted inferior baths where the genuine *"Standard" guaranteed* bath has been specified and ordered.

To protect the interests of buyers and to prevent substitution, we caution all purchasers of *"Standard"* goods that every genuine *"Standard" guaranteed* bath is plainly labeled as such.

In addition to the guarantee labels appearing on *"Standard"* baths, we will issue gratis to every purchaser of the *"Standard"* Green and Gold label bath, an official guarantee insuring the fixture against defects in material and workmanship for *five years* and the same guarantee on Red and Black label baths for *two years.*

**When you are buying your bathroom fixtures take advantage of this Bath Insurance. Write now for full information.**

Address **Standard Sanitary Mfg. Co.**, Dept. 22, Pittsburgh, Pa., U. S. A.

Offices and Showrooms, New York, 35-37 W. 31st Street. Pittsburgh: 949 Penn Avenue. Boston: 712 Paddock Building. Chicago, 415 Ashland Block. St. Louis, 100-102 N. Fourth Street. Louisville, 319-323 W. Main Street. Philadelphia, 1128 Walnut Street. New Orleans: Corner Baronne and St. Joseph Streets. Cleveland, 648-652 Huron Road, S. E. Toronto, Canada, 29 Richmond Street, E. Montreal, Canada: 39 St. Sacrament Street. London, E. C., 57-60 Holborn Viaduct.

# Away from the Commonplace

—Into the realm of the rarest confection delights—you will class

## NABISCO

SUGAR WAFERS

Out of the ordinary in dainty form, in delightful goodness, in dessert adaptability.

*In Ten Cent Tins*

Also in twenty-five cent tins

NATIONAL BISCUIT COMPANY

# The New 88 Note ANGELUS

In purchasing a player-piano or exchanging your old-style piano, for the modern one which everyone can play (as you will soon find it expedient to do) it is to your best interests to secure for yourself the finest and most completely equipped instrument it is possible to have.

Month after month, through these pages, we have been advancing argument after argument in favor of the ANGELUS Player Piano. We have given you reason after reason why it is better, and why, from every practical view-point, its possession is infinitely more desirable than that of any other instrument of its kind. To these reasons, we now add still another.

The ANGELUS Player-Piano, instead of restricting the user to the incomplete 65-note range, is now built to play the full 88 notes, the entire compass of the piano keyboard.

This new and extremely important feature, gives you exactly the same playing range as that of the concert-pianist—the full 88-note range—from the lowest note in the bass, to the highest note of the treble.

# PLAYER-PIANO

The new 88-note ANGELUS plays all 88-note and all 65-note music rolls. This gives the user a far more comprehensive selection of music than is available for any other player-piano.

The 88-note ANGELUS rolls have three exclusive features, which assure a musicianly rendition.

These; The *Artistyle Expression Characters*, indicating proper tempo, volume and accent so clearly that the playing of even a novice is as artistic as that of a skilled pianist; *Marginal Perforations*, which cause the *Melodant* to accent the complete melody, note for note, in clear contrast to a subdued accompaniment; and other *Marginal Perforations*, which in controlling the sustaining pedal of the piano, produce the most delightful tone-prolonging effects.

Each of these features is obtainable only in the genuine ANGELUS rolls.

The *Phrasing Lever*, the *Melodant*, the *Diaphragm Pneumatics*, *Melody Buttons*, *Artistyle Music Rolls*, and the *Duplex Spool*, are other patented and exclusive advantages of the ANGELUS.

These comprise the most complete and most invaluable playing-equipment possessed by any player-piano made today. It will, therefore, be to your ultimate satisfaction to hear and play the ANGELUS instruments yourself, before you are led into purchasing any other.

The KNABE-ANGELUS, EMERSON-ANGELUS, and the ANGELUS PLAYER-PIANO in the United States. The GOURLAY-ANGELUS and ANGELUS PLAYER PIANO in Canada.

**Write for our beautiful new booklet, and name of convenient dealer.**

**THE WILCOX & WHITE CO.** *Business Established in 1877.* **MERIDEN, CONN.**
Regent House Regent Street London

# Colorado
## and the
# Pacific Coast

### The Oregon-Washington Limited

Leaves Chicago at 10:00 a. m. daily, via the Chicago, Union Pacific & North Western Line, reaching Portland 8:00 a. m. the third day, making direct connections for Seattle and other North Pacific Coast cities.

### The Colorado Special

Leaves Chicago at 1:30 p. m. daily, arriving Denver 4:00 p. m. next day, reducing the present schedule two hours.

### The Overland Limited

*(For first class sleeping car passengers only)* leaves Chicago 7:00 p. m. daily, arriving Denver 9:30 p. m. next day, San Francisco 7:28 p. m. the third day, reducing the running time two hours.

*The Chicago-Portland Special and the Los Angeles Limited continue to leave Chicago at 10:00 p. m., and the China & Japan Fast Mail at 10:45 p. m.; a total of five transcontinental trains, over the only double track, automatic safety signal line between Chicago and the Missouri River.*

*Direct connections with all lines from the east.*

*W. B. Kniskern*
*Pass'r Traffic Mgr., C. & N. W. Rs.*
*Chicago, Ill.*

NW1187

# It's easy to start
## in the prolific
# San Joaquin Valley California

**$1,618 from 7 acres prunes**
**$2,400 from 7½ acres grapes**
**$6,100 from 240-acre cattle ranch**

A cow and an acre of alfalfa will earn $120 a year in the San Joaquin Valley of central California.

Raisin, wine and table grapes will yield from $100 to $300 and up, per acre; peaches and apricots, $150 to $500; while oranges will produce from $250 to $500, and in many instances more than $1,000 an acre.

Multiply above figures by ten, for a ten-acre holding, and the net income is a tidy sum. There are ten million arable and irrigable acres here. You still may buy unimproved land for $50 an acre and more.

Ten acres are enough to comfortably support a small family. Twenty acres afford a fine living, with money in bank. Forty acres will make you rich. A small farm, well tilled, is the rule.

You pay from one-fourth to one third down, and enough time is allowed on the balance so that **it easily can be paid for out of the crops.**

If necessary at the start you can buy cows on time, and find temporary outside work while orchard or vineyard are growing, the small dairy being looked after by your family.

Almost anything can be raised in the San Joaquin country — oranges and wheat, figs and apples, delicate grapes and hardy potatoes. Products of the temperate and semi-tropic zones flourish side by side.

**Plenty of water** for irrigation drawn from the near-by Sierra snows.

**It is easy for one to make a start** with alfalfa and cows, or oranges and lemons, or raisins and wine, or peaches and apricots, or walnuts and olives. Land between the rows can be used, if orchard is young, for many profitable crops. The point is, to **make every square foot bear something.**

**What some farmers have done in San Joaquin County.**

E. H. Fine, Linden, Cal., has 560 prune trees and 90 French walnut trees on seven acres of land. Sold prune crop for $1,618.53; walnuts for $185 – a return of $257.65 an acre.

Mrs. C. M. Anderson, Stockton, Cal., has seven and a half acres in Tokay grapes that produced 4,300 crates. Sold them for $2,300 net, or $320 an acre.

Romane Miller, Escalon, Cal., owns 240 acres, of which 100 are in alfalfa. He raises stock and hay. In 1907 his sales totaled $6,100.

**I know this valley** from end to end. I have seen crops planted and harvested in every one of its counties. I have interviewed farmers, ranchers and merchants. I have collated the testimony of crop experts.

All this valuable information is contained in the San Joaquin Valley land folder, issued by the Santa Fe Railway. Write for it, giving full name and address. I will also send you our immigration journal, *The Earth*, six months free.

The Santa Fe employs me to help settle up its Southwest lands. The company has no land to sell, but I will gladly refer your inquiry to reliable organizations who can put you in touch with land owners, or, if preferred, you may correspond direct with secretary Board of Trade at Bakersfield and Visalia, Cal., or secretary Chamber of Commerce at Fresno, Modesto, Stockton, Madera and Merced, Cal.

**Very low fares** are offered by the Santa Fe for California colonists, daily, September 15 to October 15, 1909. The one-way fare from Chicago is only $33, from St. Louis $32, from Kansas City $25, and other points proportionately. Comfortable tourist sleepers and chair cars. The journey also may be made at other times for a reasonable cost.

**Watch for other advertisements** to follow

C. L. SEAGRAVES, General Colonization Agent, A. T. & S. F. Ry. System, 1186 Railway Exchange, Chicago

# BILLING

on the

# Remington

means more than billing on any other machine, because it means the absolute completion of the bill—items, additions, deductions, totals—everything; and as many copies as you want.

Let us show you

The New Model

## No. 11 Remington Billing Typewriter

with Wahl Adding and Subtracting Attachment

## Remington Typewriter Company

(Incorporated)

New York and Everywhere

THE STANDARD PAPER FOR BUSINESS STATIONERY—"LOOK FOR THE WATER-MARK"

THERE are certain Great Names in the manufacturing world that stand for Genuineness and for Sincerity. The best people, socially and financially, use the goods on which these names are stamped.

# Old Hampshire Bond

for your letterhead, puts you in the right company.

Let us send you the OLD HAMPSHIRE BOND Book of Specimens. It contains suggestive specimens of letterheads and other business forms, printed, lithographed and engraved on the white and fourteen colors of OLD HAMPSHIRE BOND. Write for it on your present letterhead.

Hampshire Paper Company

The only paper makers in the world making bond paper exclusively

South Hadley Falls, Massachusetts

MADE A LITTLE BETTER THAN SEEMS NECESSARY"—"LOOK FOR THE WATER-MARK"

# The Writing Machine That's Ten Years Ahead is the Writing Machine for You

Every operating device inbuilt where it should be—under the operator's hand. Shift-key, shift-lock, space-bar, tabulator, spacer, back-spacer and margin-release—all handy, convenient, right at your fingers' ends.

## The One Big Reason why the New Model

# L. C. Smith & Bros. Typewriter

*ALL THE WRITING ALWAYS IN SIGHT*

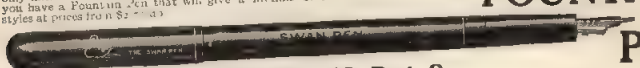
has sprung so surely, so rapidly into popular use is the fact that typewriter users and typewriter buyers are recognizing, more and more every day, the need for a writing machine that measures up *at every point* to the highest scale of modern business needs. All the writing *always* in sight, ball-bearings at every frictional point, a biller inbuilt, a quicker automatic ribbon reverse—four only of many equally vital advantages that make this machine the *first favorite always* of the person who has to pay for it and the person who has to use it.

Better work and more of it, greater efficiency through and through, the L. C. Smith & Bros. Typewriter is ten years in the lead. The writing machine that's ten years ahead is the writing machine for *you*. Send for the book and read it.

**L. C. SMITH & BROS. TYPEWRITER CO.,** (Branches in all Large Cities) **SYRACUSE, N. Y., U. S. A.**
Head Office for Europe, Asia and Africa: 19 Queen Victoria Street, London, E. C.

# Constant Use "SWAN" FOUNTAIN PEN

is the real test of durability in a Fountain Pen and it is in the hard grind of every day business that the "SWAN" Fountain Pen shows its superority shows that it is the only pen for the busy man its Gold Pen is the finest ever put into a Fountain Pen it has the only natural and practical Feed Get a "SWAN" that just suits your hand and you have a Fountain Pen that will give a lifetime of service. There are many styles at prices from $2 and up



**MABIE, TODD & CO., Dept. O**
**149 DEARBORN ST., CHICAGO**
**17 MAIDEN LANE, NEW YORK** Established 1843
London Paris Brussels Manchester

The "Long-short" Stylo is a handy, serviceable little Ink Pencil that will go in a purse. Costs but $1.50. red or black rubber—made in our Polish Factory. Our new Booklet is ready to mail—Send for it today.

Packer's Tar Soap
A constant protection to those with healthy skin—priceless to those less fortunate; unequalled for
Bathing and Shampooing
Delightfully refreshing, thoroughly cleansing, emollient and antiseptic.
Pure as the Pines
The Packer Mfg. Co., New York

# The Howard Watch

AEROPLANE flying imposes unforeseen and trying conditions on a watch.

The Wright Brothers, at Le Mans, France, had most unsatisfactory experiences with all the watches they tried. They came back from Europe determined to buy HOWARDS.

The aeroplane vibrates with the throbbing of the engine. It tilts at all angles. Often it lands with a jolt that would ruin the balance wheel of many a watch.

Orville Wright adopted the HOWARD for his record flights before the U. S. Government, at Fort Myer.

The HOWARD upheld its sixty-seven years' reputation as a practical timepiece. Its special hard-tempered balance beat true—even in the shock of a landing that threw the watch to the ground. The HOWARD adjustment proved itself *permanent*.

There can now be no question that the HOWARD is the watch for the aviator.

A HOWARD Watch is always worth what you pay for it.

The price of each HOWARD Watch, from the 17-jewel in a fine gold-filled case (guaranteed for 25 years) at $35.00; to the 23-jewel in a 14K. solid gold case at $150.00—is fixed at the factory, and a printed price ticket attached.

Drop us a postal card, Dept. X, and we will send you a HOWARD book of value to the watch buyer.

**E. HOWARD WATCH COMPANY**
BOSTON, MASS.

# This Cub

Has a mother who knows how to keep a boy busy, and the whole family can enjoy breakfast with

# Post Toasties

Crisp, Nourishing, Golden-brown Bits, ready to eat from the package, or with cream and sugar. Saves mother's time, and delights the childish appetite—

**"The Taste Lingers"**

Made at the Pure Food Factories of

**Postum Cereal Company, Ltd., Battle Creek, Mich., U. S. A.**

# Royalty Could Desire No Finer Gift

This is truly the car for Christmas—the gift beyond compare.

All the appointments are in such exquisite taste, the lines so graceful, the upholstering and finish so luxurious and the power control so perfect that this car captivates every woman in sight.

The seats are wide, soft and deep—you fairly revel in their comfort and roominess.

The upholstering of rich, imported broadcloth or leather matches the body in any desired color. Every body requires ninety days in the making. We put into its building the experience gained in 57 years of high-class carriage making for particular people,

Only one thousand Rauch & Lang Electrics can be built in a year. But each one is a masterpiece, superb in style, finish, power and charm.

## The Car a Woman Can Drive With Safety

All the power is controlled by one single lever. A Rauch & Lang car cannot be started accidentally—the controlling lever must first be in a neutral position.

Yet all the power can be shut off instantly in any position.

The small, flat key which locks the power connection can be slipped in the pocket-book when leaving the car.

The highest type of Exide batteries are used, giving power to run a Rauch & Lang car as far as you'll want to go in a day.

**Rauch & Lang Electrics**

## Get It For Christmas

Our dealers in most of the principal cities will be glad to demonstrate this exclusive car. Delivery will be made to suit your convenience, on Christmas day if desired.

Cut out the memo below and mail it to us today for the catalog with prices.

**The Rauch & Lang Carriage Co.**
**2213 West 25th Street**
**Cleveland, Ohio**

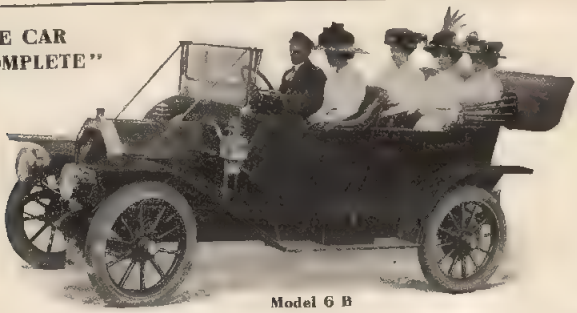
Please send your catalog and name of your local agent.

Name_____

Address _____

City_____

"THE CAR COMPLETE"



Model 6 B

# This Five-Passenger Family Car

Is the embodiment of Comfort, Convenience, Endurance—a real "Get there and back the same day" car. It is a representative type of the

Firestone COLUMBUS

which, for reliability, service, and satisfaction is in a class by itself. It has ample power and speed, and is roomy and luxurious.

You will be pleased with the specifications, which are detailed in our new catalogue No. 26. Write for a copy to-day.

**THE COLUMBUS BUGGY CO., 526 Dublin Ave., COLUMBUS, OHIO**

Builders of the Famous Columbus Electric

FISK TIRES are the BEST

The Fisk Rubber Company Chicopee Falls Mass.

# The Logical Way

to do combined writing and adding is on a combined writing and adding machine

## The New Model 11

of the

## Remington Typewriter

with Wahl Adding and Subtracting Attachment is the only general writing machine which adds. It is the only adding and subtracting machine which writes. It is the only machine which affords the maximum of labor-saving in combined writing and adding work.

**Remington Typewriter Company**
(Incorporated)
New York and Everywhere

# The Logical Way

to do combined writing and adding is on a combined writing and adding machine

## The New Model 11

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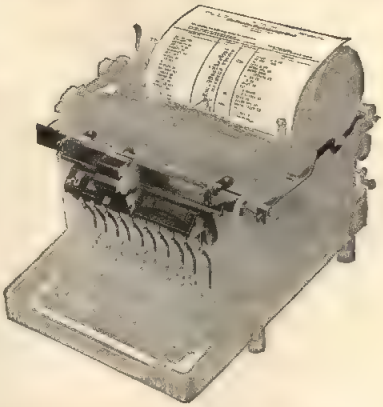
**Remington Typewriter Company**
(Incorporated)
New York and Everywhere

IT Both Writes and Adds at One Operation

IT Either Writes or Adds as the Operator Wills



The New Model 11 *of the*

# Remington

## Typewriter

## With Wahl Adding and Subtracting Attachment

presents a new and matchless combination — the latest model of the greatest writing machine with the only adding and subtracting attachment ever placed on a typewriter.

This combination means the doubling of the field both of the writing machine and the adding machine. It opens new opportunities for time and labor saving in every kind of billing and general accounting work.

Illustrated descriptive booklet sent on request.

Remington Typewriter Company
(Incorporated)

New York and Everywhere

# COLORADO

Sightseeing that has no equal the world around, an invigorating atmosphere that gives an added zest to life. Sports of all kinds for those inclined that way, perfect hotel accommodations for those seeking rest and recuperation.

## "Rock Island to the Rockies"

The only road with direct lines from the East into both Denver and Colorado Springs. Several superbly equipped through trains (including the de luxe Rocky Mountain Limited) daily from Chicago and St. Louis.

*Send for our free book "Under the Turquoise Sky," illustrates and describes beautiful Colorado.*

JOHN SEBASTIAN
Passenger Traffic Manager
15 La Salle Street Station
Chicago, Ill.

Rock Island

# On the rim of the Grand Canyon

Santa Fe

Besides the thrilling trip down and up Bright Angel trail at **Grand Canyon of Arizona,** you also may enjoy rides along the rim in modern canyon coaches. You go winding through fragrant pine forests with frequent glimpses of this gigantic gorge, which is colored like a sunset.

El Tovar provides city club comforts. A $250,000 hotel set in a wonderful wilderness; management of Fred Harvey.

California and lovely **Yosemite,** in the high Sierras, next. Thence to **Seattle Exposition,** and **Alaska.** Home through the **Colorado Rockies.**

See all of the West this Summer at small cost. **Very low excursion fares.**

Won't you let me assist in planning your tour by mailing these Santa Fe '09 Summer books?

"A Colorado Summer," "Titan of Chasms," "California Summer Outings," "Yosemite."

Also special convention folders for N. E. A. at Denver, G. A. R. at Salt Lake, Elks at Los Angeles, and the Seattle Exposition

Free on request. Say which ones you want.

W. J. Black, Pass. Traffic Mgr.,
A. T. & S. F. Ry. System,
1118-E Railway Exchange, Chicago.

THE PRIZE EDITION
OF
# "New York's Leading Fashion Catalogue"
(NOW READY)

**Compiled from the suggestions and ideas of over 55,000 brainy, bright women**

***WRITE FOR FREE COPY***

No other Fashion Book is so complete—so authoritative or so valuable as **this 124-page Prize Edition.**
HERE are two samples of the **Styles** and **Values** shown on every page of this Fashion Catalogue

## Suit No. O 26—$14.75

**Express Prepaid**

**Ladies' Suit of fine all wool Broadcloth.** Colors: Black, Navy, Taupe or Green

**The Coat:** a model that displays the popular single breasted coat suit in trim, attractive fashion. Hercules braid is applied down the full length (front and back), extending upwards in points at the side seams. Bottom of coat is braided with silk soutache the same effective trimming being used on the sleeves. Notched collar edged with satin and finished with soutache loops. The lapels are inlaid with satin. The coat is lined throughout with Guaranteed Satin

**The Skirt:** is the popular nine-gore model with groups of side-plaits arranged at each gore falling from the knee.

Sizes 32 to 44 bust. Always order by bust measurement.

## Coat No. O 142—$14.95

**Express Prepaid**

**Ladies' Coat of very fine heavy-weight, all-wool Broadcloth** in black only. This natty coat pictured here is single breasted and made with a semi-fitted back. The fullness is arranged below the waistline at each side in deep, graceful box-plaits, which are headed by wide bands, the latter trimmed with buttons. The shawl collar is very large and white striped velvet edged with satin braid, and lined through out with guaranteed satin. Sizes, 32 to 44 bust measure.

**OUR GUARANTEE**

If you are not perfectly satisfied with anything we send you—we want you to return it to us immediately, and we will promptly and cheerfully refund the money.

**YOU TAKE NO RISK**

**Suit No. O 26 — $14.75**
**Express Prepaid**

ADDRESS DEPT. O.

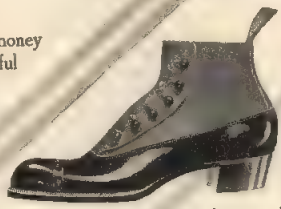
**Coat No. O 142 — $14.95**
**Express Prepaid**

# Simpson Crawford Co.
SIXTH AV. 19TH TO 20TH STREET. NEW YORK.
FOUNDED 1865

# CORRECT STYLES IN STETSONS

The Stetson styles for Fall are ready now. Each shoe is a Fall-Style masterpiece. To produce the superlative footwear shown in these newer Stetson styles demands the utmost proficiency in every department of shoemaking.

It requires the best material money can buy; the work of skillful hands, through every process of the making; the best thought of expert minds; *and then the Stetson test.*



Unless every shoe answers in the highest degree every Stetson requirement of comfort, style and fit, it does not go into the box. The quality needs no testing.

**Stetson Fall Styles can be seen only at shoe stores displaying the RED DIAMOND SIGN, and there never was footwear better worth the seeing.**

THE RED DIAMOND TRADE MARK

THE STETSON SHOE

APPEARS ON EVERY STETSON SHOE

## The STETSON SHOE COMPANY

SOUTH WEYMOUTH, (Dept. E.) MASS.

New York Shop, - - 7 Cortlandt Street

---

PRICE $1.50 AND UP

# STAR SAFETY RAZOR

The STAR SAFETY RAZOR is the only one that gives entire satisfaction. The fact that it has a FORGED BLADE like the old style razor which can be STROPPED AUTOMATICALLY and will LAST INDEFINITELY, proves that there is no need of continually buying blades and guarantees the Star to be the BEST and most INEXPENSIVE razor on the market that gives universal satisfaction. Five million users in the past thirty years are positive proof of this statement.

No ROUGH EDGES to IRRITATE the FACE; the blade is guaranteed to shave the HEAVIEST BEARD without causing irritation or discomfort. A quick, comfortable and enjoyable shave is assured the user. Catalogue on request. KAMPFE BROTHERS, 5 Reade St., New York City.

FIRST AID TO THE PENLESS

The "SWAN" is very long lived, that is why the makers of the most durable Fountain Pen adopted the name "SWAN" for a Trade Mark.

JUST A WORD about its ACTION. It has the ONLY NATURAL FEED, therefore the BEST. The flow in the SWAN FEED is the same as dipping in an ink bottle—it holds the ink above and below. Then it's ADJUSTABLE. A touch of the finger regulates the quantity of ink supplied. Many styles.

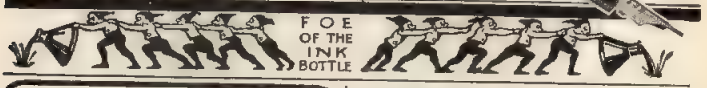
# "SWAN" FOUNTAIN PEN

Prices from $2.50 upwards

**MABIE, TODD & CO., Dept. 0**

**17 Maiden Lane, NEW YORK** Established 1843 **149 Dearborn St., CHICAGO**
**London** **Paris** **Brussels** **Manchester**

The **"Long-Short" Stylo** is a handy, serviceable little Ink Pencil that will go in a purse. Costs but $1.50, red or black rubber—made in our English Factory. Our new Booklet is ready—send for it today.




MURRAY & LANMAN'S FLORIDA WATER

**A Toilet Treasure**

**Without exception the best and most popular Toilet Perfume made**

IN the Bath it is cooling and reviving; on the Handkerchief and for general Toilet use it is delightful; after Shaving it is simply the very best thing to use.

**ASK YOUR DRUGGIST FOR IT. ACCEPT NO SUBSTITUTE!**

## TWO IS COMPANY, BUT THREE'S A CROWD

DOG

It's clear to me that Dog Days have gone by,
I might as well crawl off somewhere and die.
It's time they laid me on the shelf,
I'm mad enough to bite myself—
Of course, you all can see the reason why.

LITTLE GIRL

Isn't it peculiar, Kittie,
How some folks can be so proud
When they know it is a pity
That One Extra makes a crowd?

DOG

Never has she smiled or spoken,
Never has she talked out loud;
But, by Gum, my nose is broken—
"Two is Company, but Three's a crowd."

DOG

Such treatment would make any dog feel blue.
So won't you find a shelf for me? -Please do!
For here A There are no dogs allowed "—
"Two is Company, but Three's a crowd."
You know, I could grow very fond of you.

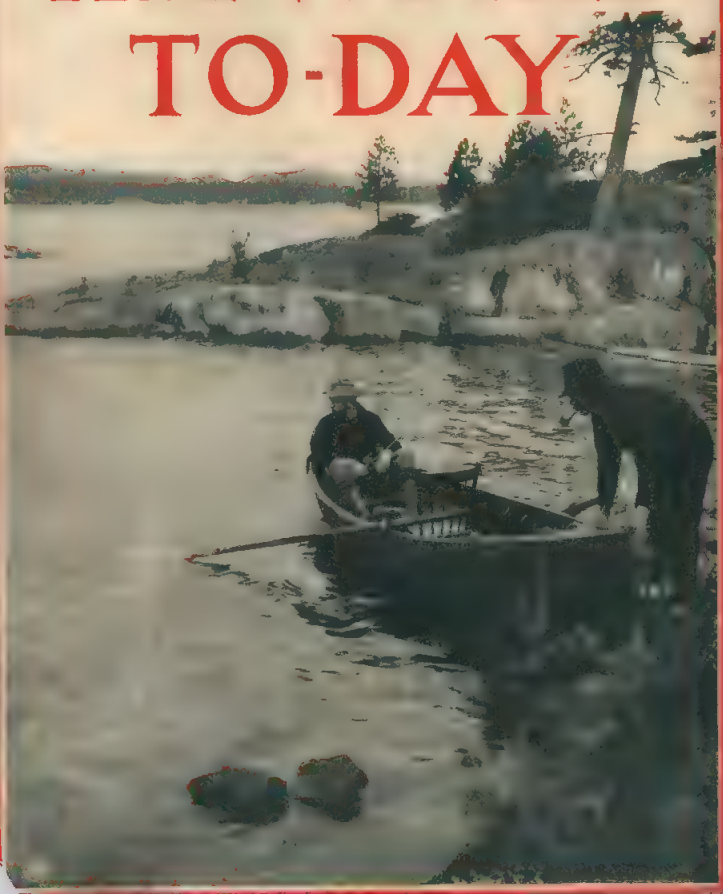
Copyrighted, 1909, by Hub-State Sales Co.

We will send this beautiful little group, cast in ivory tint, 6½ inches high, a most attractive ornament for the living-room, library, den, nursery, boudoir or bedroom; express prepaid upon receipt of $1.50. *A delightful Christmas gift for the lover of children or animals. Money refunded if not satisfactory.*

**Address HUB-STATE SALES CO. P.O. Box 1758, Boston, Mass.**

JUNE 1909 15 CENTS

# THE WORLD TO-DAY



THE WORLD TO-DAY COMPANY, CHICAGO
EASTERN OFFICE, 156 FIFTH AVE. NEW YORK

# Cool Colorado is the Land of real vacations

Six thousand miles of trout streams; mountain peaks which make the Alps green with envy; and air—why a few lung fulls of Colorado air are alone worth a trip across the continent.

The de Luxe Rocky Mountain Limited

—with stenographer, maid, barber and valet—makes the trip easy; actually a pleasure in itself. One night out from Chicago—two from the Atlantic Coast. Several other splendid trains every day from Chicago, St. Louis, Kansas City, Memphis and Birmingham.

**Can you afford not to go?**

*Write for our new eighty page illustrated book which tells how inexpensively you can spend a few weeks in the Rockies. Our folder "Thro' Scenic Colorado and Yellowstone Park to the Alaska-Yukon-Pacific Exposition" is also free for the asking.*

JOHN SEBASTIAN, Passenger Traffic Manager
15 La Salle Street Station, Chicago, Ill.

Rock Island-Frisco Lines

TWO YEAR OLD CHICAGO
La Salle street, looking north from Jackson boulevard

TWO YEAR-OLD CHICAGO
Adams street, looking east from La Salle street

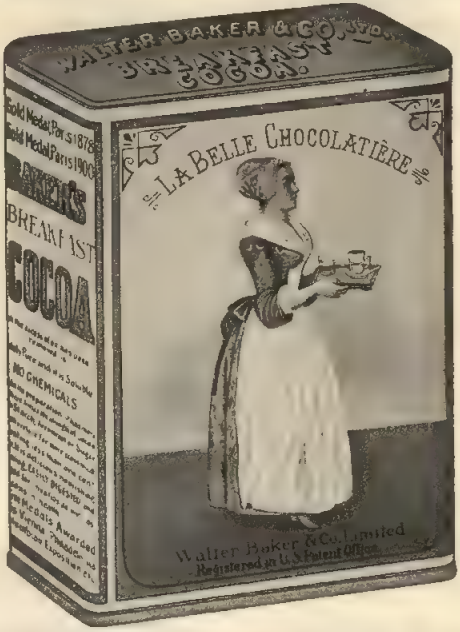
TWO-YEAR-OLD CHICAGO
State street, looking south from Washington street

TWO-YEAR-OLD CHICAGO
Monroe street, looking east from La Salle street

THE GENUINE

# BAKER'S BREAKFAST COCOA

EIGHT OUNCES—PURE COCOA  Note the trade-mark and lettering on the can




**52 HIGHEST AWARDS IN EUROPE AND AMERICA**

A new and handsomely illustrated recipe book containing chocolate and cocoa recipes by Miss Parloa, and forty new recipes for home-made candies by Mrs. Janet McKenzie Hill, will be sent free by mail to any address

## WALTER BAKER & CO. Ltd.

Established 1780  DORCHESTER, MASS.

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# WANAMAKER'S

## You Get What You Want Promptly
## No Matter Where You Live

Wanamaker's Mail Order Service annihilates the distance between your home and the Great Store. It loosens the fetters that bind you to local styles.

If you come to New York you will visit the Store, of course, but a personal visit *does* take time and money, both of which we can now save you. We pay even closer attention to the mail order, because *the responsibility is all on us — we are acting as your personal agent.*

**Coffee Urn**
(or PERCOLATOR)
**$5.50 Express Charges Paid.**
Order No. AA 155

It's always easy to recognize a really *superior* cup of coffee, isn't it? Some cooks succeed with 20 cent coffee, while others could not prepare a decent drink even with the 50 cent kind. But even a poor cook with cheap coffee makes a good drink with this Coffee Urn. It's impossible to fail with it. We have it in nickel over copper, or in brushed copper, dull finish. State your preference. It has an improved alcohol-gas lamp which makes an intense blue flame. Delicious coffee, 4 large cups, ready to drink in 10 minutes.

Don't think your order is thrown into a hopper with thousands of others, to be ground out mechanically. Only expert employees are allowed to touch it. We give it to an experienced "shopper," who is required to take all the time necessary, who selects the goods *personally*, and who spares no pains to get everything correct. The customer herself could be no more careful, and her knowledge of the merchandise is not always so good as that of the experienced shopper, who is in touch with fashions, domestic and foreign.

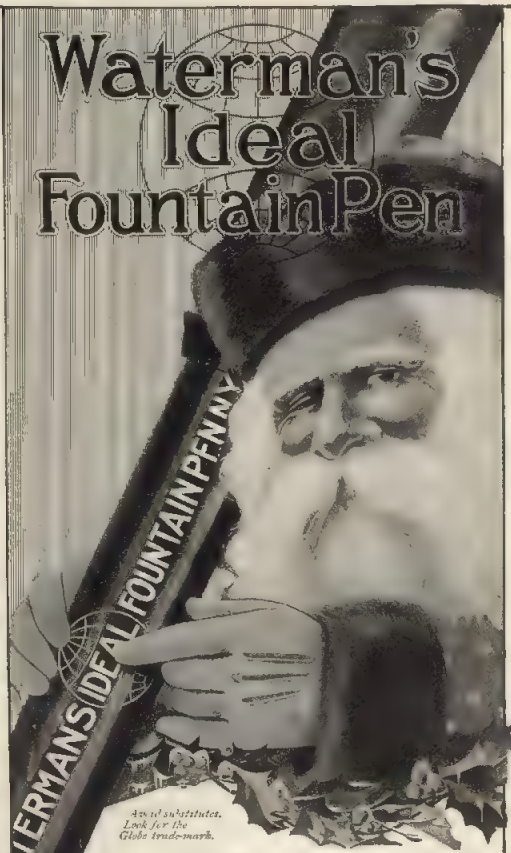
It makes no difference what you want—it may be a crochet needle, a piano, or a suite of furniture. You may want a good iron bed for $6.50, or a big cast-brass one for $500. *We have all of them.* Our "know-how" specialists will redecorate and refurnish your home. Just tell us. Their advice is free.

Do you want dependable wearing apparel? Ask for catalog. Our new Holiday Books of Gifts and Toys are now ready. Let us send them. In Furniture our display is unequalled in Mission, Colonial, Modern and Palatial styles. Tell us the pieces you want, and give us a hint as to the style, and we will send you beautiful reproductions, on loose-leaf art sheets. With such illustrations it is not necessary that you actually see the furniture in order to make an intelligent purchase. And besides, you know, the Wanamaker Name is back of anything we sell. Satisfaction guaranteed, or goods may be returned at our expense.

*You will find on this page a picture and description of just one offering which will give you a relative idea of Wanamaker values.* Send for it, at the same time you send for the catalogs you want. Write today to

**JOHN WANAMAKER**
Section X New York

# Waterman's Ideal Fountain Pen




*Avoid substitutes. Look for the Globe trade-mark.*

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| No. 12 | $2.50 |
| No. 13 | 3.50 |
| No. 14 | 4.00 |
| No. 15 | 5.00 |
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In Gift Boxes
Clip on Cap 25c. extra.

## A Christmas Reminder

Simple and good as Waterman's Ideals are they make the best and most useful gifts that you can select for your friends or relatives. We emphasize the trade-mark to assist you in buying; it characterizes the only pen that is carefully made from the finest materials. The prices run from $2.50 for the handsomely finished plain style up to as much as you fancy to pay for the richly gold or silver mounted styles. Whatever you pay our unconditional guarantee covers the pen. Gold Pens to suit every hand are exchangeable.

**From Dealers Everywhere. Illustrated Booklet on Request.**

**L. E. Waterman Co., 173 Broadway, N. Y.**

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| Sterling Silver Filigree | |
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| No. 414 | 7.00 |
| No. 415 | 8.50 |

In Gift Boxes
Sterling Clip on Cap 50c. extra

## The Personality of a Letter

consists no less in its appearance than in the style of its written contents.

White & Wyckoff's

# AUTOCRAT LINEN

is made in styles and sizes to afford the freest play to personal preference; yet may be relied upon as perfectly correct for the various occasions of social correspondence.

**In tastefully decorated boxes, each bearing the name White & Wyckoff, making Holiday Gifts at once beautiful and useful.**

Made of selected rag stock in the world's writing-paper center. Every sheet is thus water-marked: AUTOCRAT

*For Sale Wherever Good Stationery is Sold*

Let us have your name and address, so we may send you our

## Free Portfolio of Full-Size Samples

of White & Wyckoff's Autocrat Linen in correct sizes and finish of paper and envelopes, with no printing on them, so you may see them in correspondence and order your selection through your dealer. If he will not supply you, we will. We should appreciate having your dealer's name when you send for the Free Portfolio.

We will also send you with these Free Samples our **Free Booklet,** "Hints and Say of Correspondence Etiquette," an authoritative book of reference of correct usage in everything relating to social correspondence and the use of visiting cards.

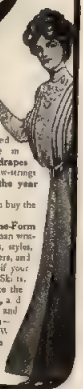
## Autocrat 1910 Calendar

**of twelve leaves, 13 x 20 inches, with beautiful art panel illustrations printed in three colors, with holidays uniquely pictured and explained and days of month in bold, readable type, sent for 10c (coin or stamps) to pay postage and packing**

**White & Wyckoff Mfg. Co.**
506 Water Street Holyoke, Mass.

# Fine-Form MATERNITY SKIRT

Registered in U. S. Pat. Office



of great interest to

**Every Prospective Mother.**

Something new — only scientific garment of the kind ever invented. Combines solid comfort and ease with "fine form" and elegant appearance in the home, on the street, and in society. — **Always drapes evenly in front and back** — no bulkiness — no draw-strings — no lacing — no ripping or basting — **Can be worn the year round.**

Made in several styles, and at prices lower than you can buy the material and have them made at home

**FREE** Send for our **Fine Illustrated Book — "Fine-Form Maternity Skirt"** — It's Free to every woman writing for it. Tells all about these skirts, their advantages, styles, material, and cost. Gives opinions of physicians, dress-makers, and users. **10 Days Free Trial.** When you get our book, if your dealer has not yet been supplied with Fine-Form Maternity Skirts, make your selection of material and style, and we will make the garment to your order. When you get it, **wear it ten days,** and **if you don't find it exactly as represented,** send it back and we will cheerfully **refund every cent** paid. **Other Skirts** — If not in need of a maternity skirt, remember our famous B & W dress and walking skirts will positively please you — **same guarantee** — Illustrated book free. Which book shall we send? Write to-day to

**Boyer & Williams Co., Dept. 47 Buffalo, N. Y**

**WARNING**

To protect you against disappointment we caution you that the Fine-Form **Maternity Skirt** is the only Maternity Skirt on the market that is the only skirt which can always be made drapery evenly, front and back—all substitutes offered will rise at front during development—and it is to regulate to every woman of refined tastes. No pattern can be purchased anywhere for this garment. Its special features are protected by patents.

## Delicately Scented With Violets

**Mennen's Violet Talcum Toilet Powder appeals to those who prefer a violet scented Toilet Powder. It is absolutely pure, because it is simply the original Mennen's Borated Talcum Toilet Powder. It is the only Powder that has the scent of fresh cut Parma Violets.**

**To make sure you get the genuine, look for Mennen's head on the cover. Refuse all substitutes and imitations. Put up in the "Box that Lox."**

***Sample box for 2c. stamp to cover postage***

Guaranteed by the Gerhard Mennen Company under the Pure Food and Drugs Act, June 30, 1906. Serial 1542

**GERHARD MENNEN CO. • Newark, N. J.**

# MENNEN'S BORATED VIOLET TALCUM TOILET POWDER

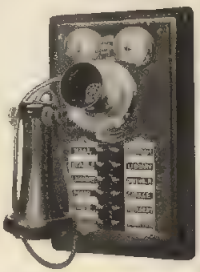
# Simple As Can Be

**Just Push a Button and Talk with**

## *Western-Electric* Intercommunicating Telephones

They put you in instant communication with any part of the house at any time of the day or night. So simple a child can use them—nothing complicated to cause trouble. No operator or switchboard is required—just push a button and the connection is made.

**A complete system with which you can talk to the cook, butler, maid, nursery or chauffeur from any room in the house. Will cost less than $25 per station for labor and all material. The maintenance cost is negligible.**



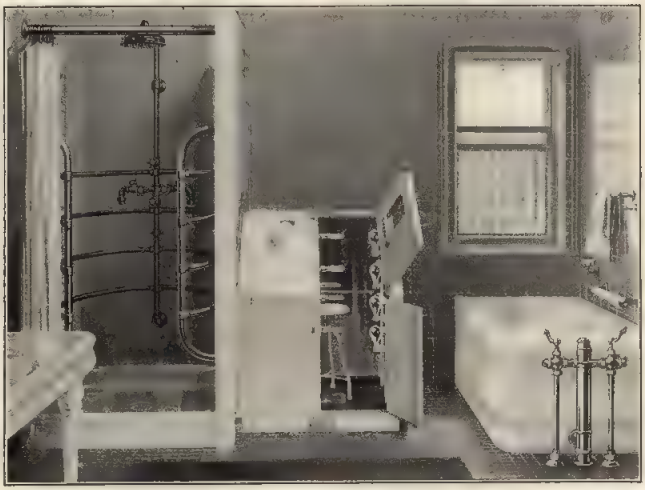
These telephones are made by the manufacturers of the celebrated "Bell" telephones and are guaranteed to give satisfactory service.

***If you are a home builder or ever expect to be one, let us tell you about the system. Just write our nearest house for Bulletin No. 7366.***

**WESTERN ELECTRIC COMPANY**

New York, Boston, St. Louis, Denver,
Philadelphia, Pittsburg, Kansas City, Dallas,
Atlanta, Omaha
Chicago, Cincinnati, San Francisco, Seattle,
Indianapolis, Minneapolis, Los Angeles, Salt Lake City.
Northern Electric and Manufacturing Co., Ltd., Montreal and Winnipeg.

# MOTT'S PLUMBING



ELECTRIC Light properly controlled and used in connection with the bath, has a tonic effect on the body similar to that of an open air sun bath, and more invigorating than a Turkish Bath. Both in Europe and America Electric Light Baths are now provided in many residences of the better class.

We have perfected and now offer an Electric Light Cabinet which has been approved by the highest authorities on hydro-therapeutics. It can be installed in any bathroom wired for ordinary electric current and occupies a space only 43" by 49".

Detailed description of this equipment, (also hot air and vapor cabinets) sent on request.

WE make every fixture for modern bathroom equipment in Imperial and Vitreous Solid Porcelain and Enamelled Iron of the highest type.

**"Modern Plumbing"**

is a helpful booklet for those planning new bathrooms or remodeling old ones. It shows 24 model interiors ranging in cost from $85 to $3,000. Full descriptions with price of each fixture. Hints on harmonious tiling and decoration. Will be sent free for 4 cents to cover postage.

THE J. L. MOTT IRON WORKS

*1828—OVER 80 YEARS OF SUPREMACY—1909*

Fifth Ave. and 17th St., - New York City

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A TOAST TO
WHITE HOUSE COFFEE

"Here's to the cup that lends to sumptuous repast its chiefest zest.
Without it, not a table---at morn or noon or night---is at its best."

IT SUITS WHEN OTHER COFFEES DISAPPOINT.

White House Coffee is being distributed as fast and as generally as is possible, and it is only a question of time when every worth while grocer will be able to supply you from stock on request. In the meantime, if it has not yet reached your grocer, you will be doing him and yourself an injustice to favor it as we personally suggest that he obtain it for the use of his customers who, like yourself, appreciate coffee of the highest character and prefer possessing the distinctiveness of flavor peculiar alone to "White House."

White House Coffee is packed only in 1, 2 and 3 lb. sealed tin cans and guaranteed to be in perfect condition and genuine if label is unbroken.

DWINELL-WRIGHT CO. PRINCIPAL COFFEE ROASTERS BOSTON-CHICAGO.

BEST
HOT WATER
RESIDENCE
HEATING
BOILER MADE

Guaranteed and Sold Direct where we have no agent.

Capacity of Heater nearly doubled without additional fuel by use of Center Pipe carrying water up through the center of deep fire pot. Heats from all sides.

I want to sell you a heater
Write me today

PHILLIPS HEATING CO.
Dept. D. AURORA, ILL.

MENNEN'S
BORATED TALCUM
TOILET POWDER

"Baby's Best Friend"

and Mamma's greatest comfort. **Mennen's** relieves and prevents **Prickly Heat, Chafing and Sunburn.**

For your protection the **genuine** is put up in **non-refillable** boxes—the **"Box that Lox,"** with **Mennen's** face on top. Sold everywhere or by mail 25 cents—*Sample free*

Guaranteed by the Gerhard Mennen Chemical Co., under the Food and Drugs Act June 30, 1906. Serial No. 1542.

Try Mennen's Violet (odorless) Talcum Toilet Powder—It has the scent of freshcut Parma Violets. *Sample free.*

GERHARD MENNEN CO., Newark, N. J.

Mennen's Borated Skin Soap [blue wrapper] } *No Samples.*
Specially prepared for the nursery.
Mennen's Sen Sang Toilet Powder, Oriental Odor—Sold only at Stores.

ALLEN'S FOOT-EASE
Shake Into Your Shoes

Allen's Foot-Ease, **a powder for the feet.** It cures painful, swollen, smarting, nervous feet, and instantly takes the sting out of corns and bunions. **It's the greatest comfort discovery of the age.** Allen's Foot-Ease makes tight-fitting or new shoes feel easy. It is a certain cure for ingrowing nails, sweating, callous and hot, tired, aching feet. We have over 30,000 testimonials. **TRY IT TO-DAY.** Sold by all Druggists and Shoe Stores, 25c. **Do not accept any substitute.** Sent by mail for 25c. in stamps.

**FREE** TRIAL PACKAGE sent by mail.

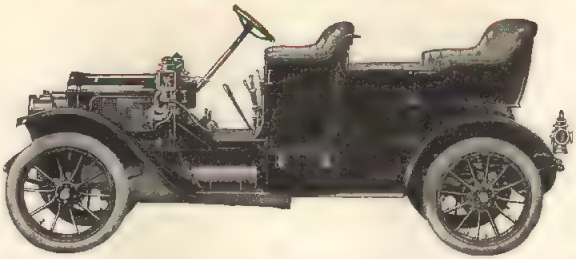
MOTHER GRAY'S SWEET POWDERS, the best medicine for Feverish, sickly Children. Sold by Druggists everywhere. Trial Package FREE. Address,

"In a pinch, use Allen's Foot-Ease."

ALLEN S. OLMSTED, Le Roy, N.Y.

# DRIVE A WHITE STEAMER

## And Use Kerosene as Fuel



The reputation of the White Steamer as the most satisfactory car for all-around use has been further strengthened by the modifications in design in the 1910 models, whereby kerosene may be used as fuel instead of gasoline.

The new fuel offers many obvious advantages. First of all, it costs from 5 to 12 cents less per gallon than gasoline. Secondly, it may be obtained at any grocery store, either in the city or in the country, and at almost any farm-house. Thirdly, kerosene will yield a greater mileage, gallon for gallon, than gasoline. Fourthly, it may be handled without any precautions; for example, the fuel tank may be filled regardless of the nearness of lighted lamps or lighted cigars. Kerosene may be stored in ordinary barrels and it is no longer necessary for private garages to install expensive underground storage tanks.

The Motor World, referring to the use of White Steamers during the recent military manoeuvres in Massachusetts, said: "The preference shown the White Steamers is explained by the fact that they can be run on kerosene in places where the use of gasoline cars is prohibited by the military regulations." The White Steamer is the only car which is carried by the steamship lines without draining its fuel tank.

We publicly proved that kerosene fuel is a complete success on the recent 2650-mile Glidden tour. Not a single penalty and not a moment's delay resulted from its use.

**Write for Descriptive Circular**

## THE WHITE COMPANY

**844 EAST 79th STREET**

**CLEVELAND**

**OHIO**

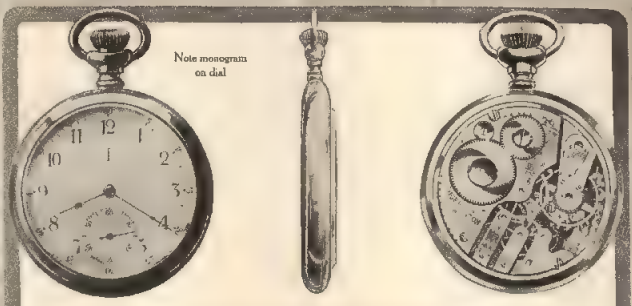
New York, Broadway at 62nd St
Boston, 527 Newbury St
Philadelphia, 2235 North Broad St
Pittsburg, 138-148 Beatty St.

Toronto, 170 King St., West

Cleveland, 847 Rockwell Ave
Atlanta, 120-122 Marietta St
Chicago, 240 Michigan Ave
San Francisco, Market St at Van Ness

# New Ingersoll-Trenton $5.00

## The Best Seven Jewel Watch $7.00 & $9.00




## *Examine this Movement*

Observe that it is a *bridge* model, the very highest type of watch construction, found only in the costliest models of other makers and the feature of *paramount* importance in every watch.

It has 7 ruby and sapphire jewels protecting the points of principal wear, will give 20 years of service. Guaranteed for 5 years.

It has a genuine compensating balance wheel, automatically adjusting itself to changes of temperature; micrometer regulator, permitting the utmost precision in adjustment; the Breguet hair-spring—all features distinctive of only the finest watches.

With the lightest mainspring in any watch of its size, it runs with that full, regular "motion" exclusive to watches of the strictest accuracy and made possible only through fine workmanship, high frictionless finish and best materials.

### Accuracy and Appearance

The Ingersoll-Trenton is a watch for the man who is exacting of his time-piece. It is a close timer. It has beauty of movement and case and not only looks like but *is* a fine watch. The cases are thin and stylish and made in a variety of patterns.

One grade of movement only **$5** in solid nickel case **$7** in 10 year gold-filled case **$9** in 20 year gold-filled case

*Sold by Responsible Jewelers Only*

You can examine the "I-T" in your own town at any jeweler's you know to be reputable. You can compare it with other watches and make your own decision before buying

It is new now, and if not locally obtainable will be sent express paid by us on receipt of price. See it before you buy a watch.

*Ingersoll Value in a Fine Watch*

Such a watch as the "I-T" could only be produced for the money by the manufacturing systems and facilities that made the Dollar watch possible.

Though of totally different character and built in factories 150 miles apart these watches represent the same value in proportion to price.

The informative "I-T" Booklet "How to Judge a Watch" free upon request.

**ROBT. H. INGERSOLL & BRO.,** 116 Frankel Building NEW YORK

WHITE & WYCKOFF'S EXCLUSIVE STATIONERY

Trade Mark

# That Harmonious Expression

of the writer's personality, which every written communication should be, is impossible where the medium employed is lacking in character.

## White & Wyckoff's

# AUTOCRAT LINEN

for all social correspondence, makes always and everywhere assured a just impression of the writer's personality.

A high quality product of the paper maker's art from Holyoke, Massachusetts, the writing-paper center of the world. Made in all shapes, sizes and finishes approved by correct usage.

Distinguished from all other writing paper by this water-mark impressed in every sheet: W&W AUTOCRAT

*Wherever Good Writing Paper is Sold*

Let us have your name and address, so we may send you our

## Free Portfolio of Full-Size Samples

**of White & Wyckoff's Autocrat Linen in correct sizes and finish of paper and envelopes, with no printing on them, so you may use them in correspondence and order your selection through your dealer. If he will not supply you, we will. We should appreciate having your dealer's name when you send for the Free Portfolio.**

We will also send you with these Free Samples our **Free Booklet,** "*The Yea and Nay of Correspondence Etiquette,*" an authoritative book of reference of correct usage in everything relating to social correspondence and the use of visiting cards.

**White & Wyckoff Mfg. Co., 506 Water St., Holyoke, Mass.**

# An All-Around Stove

Your kitchen may be well planned—everything apparently handy—yet if there is not a New Perfection Wick Blue Flame Oil Cook-Stove in it, the one greatest convenience of all is lacking.

The "New Perfection" is a home and family stove—big enough and powerful enough to do all you'd ever ask a cooking-stove to do, and, best of all, it does its work without overheating the kitchen. The

## NEW PERFECTION
## Wick Blue Flame Oil Cook-Stove

is built with a CABINET TOP just like a modern range. It is the most convenient stove ever made and is almost indispensable to summer comfort.

Three sizes. Can be had either with or without Cabinet Top. If not with your dealer, write our nearest agency.

The **Rayo LAMP** is the most perfect all-round home light. Has large font, best and latest center draft burner and beautiful porcelain shade. Nothing complicated about the Rayo—easily cleaned, easily managed. If not with your dealer, write our nearest agency.

**STANDARD OIL COMPANY**
(Incorporated)

AROUND THE WORLD BUT NEVER OUT OF INK!

You feel safe when writing a Cheque with

BLAIR'S RED ROBIN AND BLACK BIRD INK PENCILS. THE PATENT DROP NEEDLE KEEPS THE POINT CLEAR.

THE SMOOTHEST WRITING INSTRUMENTS IN THE WORLD

Are Ink Tight in the pocket. Others leak thro' vent at back end.

Note—Blair's are the only practical Ink Pencils. Take no chances on a substitute. Owing to U. S. and British Patents they can not be imitated. For Correspondence, Manifolding Rating and Stenography No leaky nr tube, tires all easier Holds 60 per cent more ink, and permits the use of Blair's Safety Ink-Making Cartridges. 10c extra. Saving cost of change punch $5.00 Point will last for years. Boon saves cost. PRICES: Plain, $1.00; Chased, $1.25; Chased and Gold Mounted, $1.50; Red Cases, 3¼ in., $1.25; Large Barrel, 4 in. or 5 in., $1.50; 3¼ in., Silver Filigree, $3.50; by insured mail, 5c more. Ordinary ink can be used.

Blair's Fountain Pen Co., 6 John St., Suite 192, New York; 15 Bishopsgate St., without London, E. C. Get Agency.

Chicago Beach Hotel

American Plan — Finest Hotel on the Great Lakes — European Plan

An ideal resort for rest or pleasure—ten minutes' ride from city, close to famous Golf links and other attractions of the great South Park System. Has 450 large airy rooms, 250 private baths. There is the quiet of lake, beach and shaded parks, or the gayety of boating, bathing, riding or driving, golf, tennis, dancing and good music. Table always the best. Nearly 1000 feet of broad veranda overlooking Lake Michigan beach.

For Illustrated booklet, address Manager, 51st Boulevard and Lake Shore, Chicago.

"NEW YORK'S MOST ACCESSIBLE HOTEL"

Hotel Hargrave

112 West 72d Street

Six lines of transit, including Elevated and Subway express stations.

A modern, high-class family and transient hotel with superior appointments.

RESTAURANT SERVICE EXCELLENT

Lake Placid, Adirondacks, N. Y.

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OPEN JUNE TO OCTOBER

Situated in Grand View Park, 400 acres of Forest and Stream -finest view in the mountains. Thoroughly modern, Elevator, Steam Heat, open Fireplaces, Public and Private Baths, Boating, Bathing, Dancing, Golf, Tennis and all other sports. CUISINE and SERVICE of the BEST.

PURE SPRING WATER

Fine music a feature of both houses.

BOTH THE GRAND VIEW AND THE HARGRAVE ARE UNDER THE PERSONAL DIRECTION OF

THOMAS PARKES

A

"Fresh Water" Sea Voyage

15,000 Miles on the Great Lakes via the

Northern Navigation Company—Grand Trunk Route

Lake Huron and Superior—Georgian Bay—30,000 Islands—Mackinac Island. Charming tours with all the comforts of the big ocean steamer. In direct connection with the

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6 SHOTS BY THE PRESSURE OF YOUR FINGER!

# WINCHESTER

## HIGH-POWER SELF-LOADING RIFLE

### .351 Caliber

**THE TRIGGER-CONTROLLED REPEATER**

THERE is nothing to take your mind off the game if you shoot a Winchester Self-Loading Rifle. The recoil does the reloading for you, which places the complete control of the gun under the trigger finger. You can shoot six shots as fast as you can pull the trigger and without taking your eye off the sights. As this rifle is made with a detachable magazine, you can replace an exhausted one with a loaded one in a jiffy and continue shooting. No recoil-operated rifle but the Winchester offers this advantage. Other desirable and distinctive features of this rifle are — a stationary barrel with sights attached, and all moving parts enclosed. The .351 Caliber, High-Power Cartridge has great killing power, making it heavy enough for the largest game.

*Catalogue fully describing this rifle—"The Gun That Shoots Through Steel"—sent upon request.*

**WINCHESTER REPEATING ARMS CO., NEW HAVEN, CONN.**

# The One Player-Piano That Really Accents

**The Most Wonderful Improvement Ever Invented is Found Only in the**

MELVILLE CLARK SOLO APOLLO PLAYER 88-Note PIANO

With the new accenting device of the SOLO-APOLLO you can interpret and play music EXACTLY AS THE GREATEST PIANISTS PLAY IT.

**The SOLO-APOLLO is the ONLY PLAYER-PIANO IN THE WORLD which brings out the MELODY IN STRONG RELIEF without impairing the symmetry and power of the accompaniment. Other so-called accenting devices MERELY GIVE A PROMINENCE to the theme by subduing the accompaniment.**

Other exclusive features of the SOLO-APOLLO are: THE TRANSPOSING MOUTHPIECE by which you can change instantly to five or more different keys by the touch of a finger; the SPRING MOTOR, which regulates the power and distributes it equally, preventing sudden changes in tempo by unconscious hard pedaling.

The MARVELOUS HUMAN EXPRESSION of the SOLO-APOLLO is secured by the DOWNWARD stroke of the pneumatic fingers on the piano key in front. This is the STROKE GIVEN IN MANUAL PLAYING and a GENUINE HUMAN EXPRESSION is the result.

The range of the SOLO-APOLLO is 88 NOTES, COVERING THE ENTIRE PIANO KEYBOARD and playing in pristine beauty all the greatest musical compositions as they were originally written.

The Melville Clark Piano in which the Apollo action is played is A CRYSTALLIZATION OF THE HIGHEST TYPE OF PIANO ARTISTRY.

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No other electric brougham can be compared with the Waverley 1910 for style.

In this equipage is achieved the perfect combination of smart lines, proportions and finish approved by the critics on the most fashionable boulevards.

The swell of the sides—the correct height—the comfortable width—the restful hues of luxurious upholstery represent life-long study of the coach body.

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Rear Admiral Chadwick; Mrs. Lucy Carnegie, sister-in-law of Andrew Carnegie; Thomas A. Edison; Herreshoff, the yacht designer; Ex-Att'y-General Charles J. Bonaparte; Secretary of the Navy George von L. Meyer; Dr. Frank Billings, of Chicago; Chairman James Tawney, of the House Appropriations Committee; Richard Cannon, son of the Speaker; and others of like prominence are Waverley owners.

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Consequently every bottle of this renowned tonic represents in a highly concentrated form the vital swelling forces of nature hidden in the living heart of barley. It intensifies all the creative mental powers, prevents the onset of disease and brings happiness, health and new vigor to all those who are weak, worn or melancholic. Physicians urge it as the best reconstructive known for nursing mothers. Order of your Druggist or Grocer this very day.

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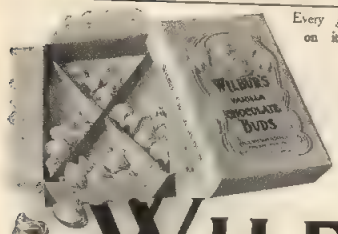


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The dainty contents of this delightful assortment of packages—their always perfect condition—have made Whitman's Philadelphia chocolates the selected favorites of fastidious folks everywhere. You should know *your* local Whitman's agent. If you don't know him, ask us for his name and we will send you a pound "Fussy Package," postpaid, for the regular price, One Dollar.

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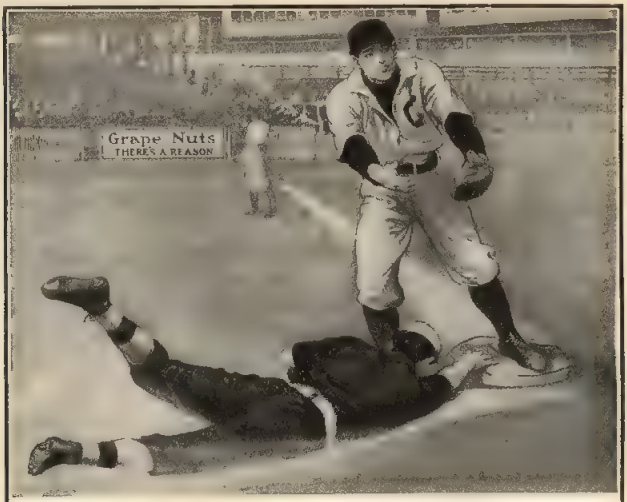
*Look for the "Fussy Seal," the "Green Box" and the "Silver Braid."*




**Ball-players**

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**Food**

May be found on the tables at Yale, Harvard, Princeton, Ann Arbor, West Point, etc., and wherever brain and brawn are essential—

**"There's a Reason"**

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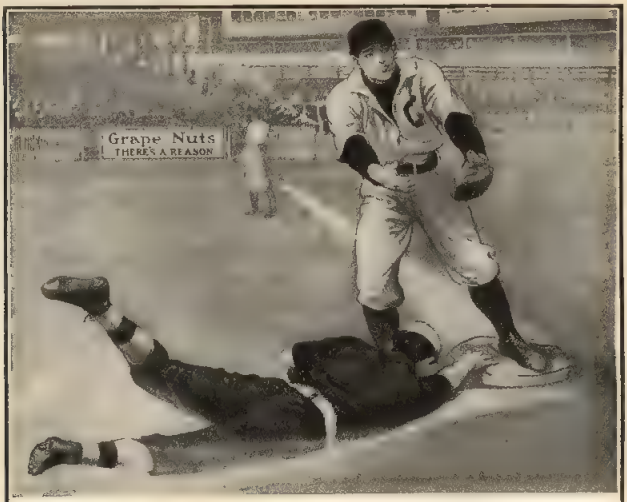


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*Behold this vain infant of two!*
*He is certainly pleased with the view.*
*You'll forgive him—I hope—*
*For he's used Ivory Soap.*
*You would feel just the same. Try it, too.*

For bath, toilet and fine laundry purposes; for the nursery; for shampooing; for everything and anything that necessitates the use of a better-than-ordinary soap, Ivory Soap is unequalled.

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has all the characteristics of our great concert grands, in modified volume. It is a *Real Grand Piano;* it occupies a distinctive position between the uprights and the larger grands; there is a scientific reason for its size, 5 feet 10 inches. When you hear it you will understand why we make nothing smaller in grand pianos. Illustrated Catalogue sent on request and mention of this magazine.

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1904, reading matter for the blind may be sent free of postage anywhere in the United States, when sent from or returned to a lending library. Scattered through Michigan are many blind people to whom books of the various Braille point systems are sent when called for, and after they have been read or studied, they are returned to the library. Thus to many not in the institution, hours of recreation and profitable study are given, as the list of books includes works of history, poetry, fiction, science, music and current literature.

As there are many of the inmates who have become blind in later life, and so have had no chance to learn to read or use the typewriter, instruction is given in this as well as in reading the embossed-point systems, in connection with the library. Those leaving the institution to go into business for themselves can therefore avail themselves of the library privileges, and besides can do their own corresponding with an ordinary typewriter. To be able to read again and communicate with others by putting their thoughts on paper, after years of not having written a single letter, is a source of boundless pleasure to many of the blind people, besides making them much more independent in their business dealings.

The library now contains several thousand volumes printed either in the Roman line-letter, the European Braille, the New York point and the American Braille, the last named being the officially recognized embossed type of the state. It is the system preferably taught in the institutions, for several reasons, the first of which is, it provides for capitalization and punctuation, and symbols for contractions, features considered valuable to advanced students and teachers of the blind. Being a three-point system more space is required than for the New York point (two point), but the advantages named more than balance the defects of the latter.

All books for the blind are bulky and heavy volumes, and to pack them for mailing, strong cloth cases of the telescope kind are used, strapped together securely. To render the return of the package easy for the borrower, the name and address of the institution are printed in large bold letters on the cover of the case, so that miscarriage is impossible. When the case goes to the borrower a tag with the name and address printed on an ordinary typewriter, is attached to the case, covering the name and address of the institution and tied down by stout twine. All the borrower has to do is to detach the tag, secure it through holes in the upper left-hand corner of the case and tie it down. The simple and easy scheme was devised by A. M. Shotwell, the blind librarian, who by education and temperament is well qualified for the exacting work of the library. In all matters pertaining to the blind Mr. Shotwell is a recognized authority of international repute.

But the teaching of reading of the embossed-point systems and instruction in the use of the typewriter to produce the characters, and the use of the ordinary typewriter of everyday kind, are not all the achievements of the blind in this remarkable institution. Shorthand for the blind is an assured fact and is now recognized as a practical field for them. The Stainsby-Wayne, the wonderful machine which is used for shorthand notes, weighs only nine pounds, and is very simple in its mechanism, having only six keys with which to form all the combinations used in the system. The blind stenographer uses the six keys just as the seeing stenographer uses his pencil, the system being much the same, only more arbitrary. By pressing on the keys with a quick, elastic touch, the raised shorthand type cipher is printed on a slip of white paper, which unwinds from a large roll placed in a bracket at the left side and travels across a tray on the top of the machine. This paper resembles the ticker used in the stock exchange. After the dictation has been taken, the paper is rolled back again and is then ready to be read with the fingers and transcribed on the typewriter. It is possible to attain a high rate of speed, the machine being guaranteed to write one hundred and forty words a minute.

The institution at Saginaw is not a copy of any other establishment, and its work and methods are very different in important particulars from those of any other working home or trade training school for blind adults.

*The blind repairing and making shoes*

# PROFITABLE EMPLOYMENT FOR THE BLIND

BY

JAMES COOKE MILLS

THE miracles performed in the early days of Christianity, of making the blind to see, the deaf to hear, and the maimed to walk, must have been of themselves sufficiently stirring and impressive. The retelling of them in our generation reveals the same elements of supernatural power, and it may be that the awakening of the American people to the nobility of helpful and practical aid to their afflicted is due in some degree to the still lingering influence of those events.

More than fifty years ago, in 1854, to be precise, and during the governorship of Andrew Parsons, the State of Michigan first gave its aid in a practical way to the education of its juvenile blind. The early legislative enactment on the subject provided but meagerly for the institution, but as the state developed and the needs became greater, more liberal appropriations were made, so that now, in the establishment of the splendid Employment Institution for the Adult Blind, Michigan has taken her place as one of the foremost states of the union, in this worthy cause.

In its school for deaf mutes at Flint, the state instituted a course of instruction and training for the blind under eighteen years of age, and this work was continued successfully for some years. By 1880 the combined institutions had so outgrown the accommodations of buildings, that the state separated them, removing the blind school to Lansing, the state capital, and there established it on a firm and enduring basis, financially and instructively. The curriculum of this school for blind children is liberal in providing instruction of

practical use in later life, including a full high-school course, and the training is most thorough.

When the state first began to adopt measures to provide for the education of its blind people, it was foreseen that all of them could not follow professional pursuits. The sightless are not confined to

A BLIND GIRL AT WORK ON A TAPESTRY LOOM

one class or condition in life, and they include the laborer, the artisan, the tradesman, the skilled mechanic and the college-bred man. This is true of women as well as men. It was necessary, therefore, to make provision for industrial as well as intellectual training.

In the school established at Flint, and later removed to Lansing, industrial trades were introduced, and it was early discovered that many persons, who had lost their sight after becoming adults, were very anxious to be taught some industrial occupation. Among those who had been thus trained at the school for the blind, many wished the school to continue to employ them, claiming that they were unable either to start in business for themselves or to secure employment in shops with seeing help. The Lansing school tried at first to meet this demand, but these endeavors, which at best could benefit only a few of the many who needed such aid, so imperiled the usefulness of the school as a moral and intellectual educational institution for the youthful blind, and also resulted in such financial loss, that these efforts to assist the older blind were entirely discontinued.

After several years of agitation, more or less intermittent, the Michigan Employment Institution for the Adult Blind was finally established in 1903, during the administration of Governor A. T. Bliss, who gave it his hearty support and considered the opening of the institution, in December of the following year, the culmination of his official life. The institution is located in Saginaw, the ex-governor's home city, and the buildings face beautiful Bliss Park, one of his benefactions.

There are four main buildings, the middle one of the group being the administration building; the dormitories, one for men and the other for women, are widely separated, on each side, while the factory, heating plant and warehouse are situated directly behind the administration building. They are built of vitrified brick, with cut-stone trimmings, and arranged with special regard to the peculiar requirements of sightless people. The administration building contains the offices and vaults of the institution, reception rooms, the state circulating library for the blind, the chapel and the living rooms of the superintendent.

As a mere matter of cost, the blind who need help, like any other class needing help, could doubtless be taken care of more cheaply in poorhouses or in other places where no attention need be given to teaching trades. But if we take into consideration the renewed hope, the regained usefulness and the brightened lives made possible by such institutions, they *are* a necessity.

An adult enjoying unimpaired use of his senses and filling a useful place in the world, when suddenly deprived of sight

BASKET WEAVING

thank for what the institution has done for me. I owe it everything. I am again a man and of some use in the world. I do not more make my people unhappy, as I am now content."

Some time ago, after some correspondence, J. S. was brought from a county poorhouse. He is doubly afflicted, being both deaf and blind. Since entering the institution he has learned to sew brooms, cane chairs, use the typewriter well, and is one of the happiest, most contented men there. The attendants and some of the inmates talk to him, by using the deaf and dumb alphabet. He simply puts his hand on that of the talker, and in this way conversation can be carried on quite rapidly, and explanations made are easily understood. Recently another deaf and blind man was admitted, and S. took him in charge to teach him the way about the buildings. Each seemed happy to have met the other, and they have been of mutual benefit.

For one of the other men, who learned piano-tuning, but had not the qualifications requisite for working up an outside patronage, the superintendent secured a good position in a New York piano factory, where he is doing well.

The problem of finding work for the women and girls is more difficult, but the institution is doing what it can to secure profitable occupations for them. Several are employed in the institution. The visitors' attendant is a blind girl, and she shows company around so well that many refuse to believe that she is entirely blind. The seamstress is a blind girl, and does all the mending and making of tablecloths, napkins, pillow-cases and sheets, using a sewing machine as well as any of her sisters who can see. Since securing a blind girl to do the dish-washing, the work has always been satisfactory.

The institution is a combination of the industrial home and the workshop, taking adults from eighteen to sixty years of age. Partially blind as well as totally blind persons are admitted. But a person with some sight is less efficient as a worker than one entirely blind and, strange as it may seem, he is a far less rapid operator. The reason for this is that one who is not entirely sightless sees objects in a dim hazy film in which nearly all detail and the general outlines fade away in the gray background, but still from force of habit and inclination the worker depends on his failing sight to aid him, while the entirely blind rely only on the sense of touch, which soon. in constant and more exacting use, becomes very keen and sensitive.

Apprentices are allowed not more than three years in which to acquire the different trades taught, and during this time board, lodging and instruction are free. After a trade has been learned, the apprentice becomes a wage-worker if he cares to remain. He is put on the pay-roll, and is paid by the piece at current wage rates. He then begins paying board, and may lodge in or out of the institution, as he prefers. As the apprenticeship idea is combined with the workshop and home, it will be readily seen that this institution never can become self-supporting, or even nearly so, as board, lodging and instruc-

by an unforeseen accident or by the slow process of disease, finds himself in a most distressing condition. In the darkness of despair, with no prospect of relief, life has little hope, for the flame of ambition —the joy of progress—has been extinguished. The weeks and months drag on until mere existence becomes a burden, the discontent and misery of the afflicted bearing heavily on the happiness of the family life. Constant brooding over the perversity of fate often affects the mental faculties, resulting in insanity unless the entire train of thought is quickly diverted.

THE FEATHER-DUSTER FACTORY

This is the only institution of its kind for the blind. There is a large market for the dusters

It is here that the employment institution proves a saving grace. It takes the sightless and teaches him a useful trade or one of the more simple professions, as the education and capabilities of the person may determine. With renewed hope and an independent spirit, the afflicted one returns to his home contented and in a cheerful frame of mind, and follows his chosen occupation, once more a useful citizen.

A few individual cases, illustrating all phases of the different things attempted, explain the work at the present time. E. W. was formerly employed as foreman in one of the large Detroit brass and copper rolling mills, and a few years ago lost his sight from an accident in the shop. For three years he was at home, nearly helpless, scarcely able to feed and dress himself. Hearing of the institution soon after it was opened, friends wrote, asking to have him admitted. He entered on February 6, 1905, and stayed until May 27, 1905. During this time he learned to use the typewriter, to read and write the Braille or point system, and made a good start at learning the broom trade. Being a man of business instincts and too old to learn to work rapidly at the broom trade, he was advised to try selling brooms. He went to Detroit and, hiring a boy to go around with him, made a canvass of the grocery stores and shops, taking orders of from one to twenty dozen brooms, and earning from $5 to $15 a week. He is now a self-respecting, producing citizen, earning enough to care comfortably for himself. From one of his letters is quoted this extract, none the less effective for its German form of expression:

"Mr. Hamilton, I can never you enough

tion for all the learners must remain free, and these apprentices always form a large per cent of the total number enrolled. During the first half of 1909, there were nearly one hundred inmates in the institution, and of this number about three-fourths are men. This is due to the fact that the problem of how best to care for and give profitable employment to blind women has not been solved. New industries are being introduced, but the difficulty seems to be in finding occupations adapted to women's strength and endurance, at which they can work rapidly enough to be self-supporting and at the same time follow when they return to their homes. The recaning of chairs, basket-making, weaving of fancy table-covers in unique and attractive designs, usually to special order, are the principal industries now carried on for women. A few of the inmates are employed in sorting broom-corn, selecting feathers for dustermaking, besides those who are engaged in the direct work of the institution.

For the men the broom trade is the principal occupation. There is an almost unlimited market for brooms, and with the institution established as it is, it is necessary to give steady employment to those wishing it. After going on the pay-roll, the men pay $2.50 a week for board, room and washing, which, it is estimated, is about the actual cost. They are paid almost entirely by the piece at current wage rates, and on this basis the poorest workman has cleared about $1 above his board at the end of the month, and the best and most rapid worker, something over $25. The plan of the institution in this regard is to pay a rate which is just and reasonable, but, at the same time not high enough to be too great an incentive to the workers to remain indefinitely after they have become skilled in their trades and can earn as much or more outside. The institution is primarily a trades school rather than a permanent home for blind people.

In addition to broommaking, cobbling is taught, and two of the men keep in repair the footwear of all the inmates besides doing some work for people in the neighborhood. The work is surprisingly well done and they have even undertaken the making of shoes with very satisfactory results. Rug-weaving from old carpets has been introduced with success, and several workers have become proficient enough to return to their home towns, set up looms and through their friends secure all the weaving they can do. Piano-tuning is taught to a few having qualifications for the work, and they have done well in every instance. Feather-duster making is the latest industry established and this institution is the first one of the kind to introduce the making of dusters. It promises well and there is a large market for the various grades of dusters made. Some portions of the work can be done well and rapidly by women, and it is clean and to their liking.

While the work of instructing and training the adult blind is new, and necessarily in more or less of an experimental stage, it has been found that many pursuits that blind people can follow can not be worked with enough rapidity to make them practical as life-work. To illustrate: Blind girls are perfectly capable of doing the best kind of work with ordinary knitting machines, such as are used in all knitting factories, but they work so slowly that they can not make wages enough to keep themselves. And when it is remembered that among those who can see, nearly every artisan of any skill or proficiency learns a trade before he is twenty-one years of age, the difficulties attendant on taking people who have become blind late in life and teaching them to become skilled workmen and at the same time rapid ones, can be slightly appreciated.

Among the men who have been admitted were former farm hands, machinists, painters, sawyers, railroad firemen, expert bookkeepers, graduate druggists, some from the army and navy, and many who, having been blind from childhood, have no trades at all. The task of helping these people to adapt themselves, in many cases, to new conditions and to form new life habits; of encouraging and cheering the most despondent ones; and of making those with families believe that they can, by hard work, again help take care of those dependent upon them, is no easy one.

One of the most important features of the institution's work is the Free Lending Library, which the establishing act requires to be conducted. By the provisions of the Rucker Bill, which was passed by Congress and became a law, April 27,

*The blind repairing and making shoes*

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In the school established at Flint, and later removed to Lansing, industrial trades were introduced, and it was early discovered that many persons, who had lost their sight after becoming adults, were very anxious to be taught some industrial occupation. Among those who had been thus trained at the school for the blind, many wished the school to continue to employ them, claiming that they were unable either to start in business for themselves or to secure employment in shops with seeing help. The Lansing school tried at first to meet this demand, but these endeavors, which at best could benefit only a few of the many who needed such aid, so imperiled the usefulness of the school as a moral and intellectual educational institution for the youthful blind, and also resulted in such financial loss, that these efforts to assist the older blind were entirely discontinued.

After several years of agitation, more or less intermittent, the Michigan Employment Institution for the Adult Blind was finally established in 1903, during the administration of Governor A. T. Bliss, who gave it his hearty support and considered the opening of the institution, in December of the following year, the culmination of his official life. The institution is located in Saginaw, the ex-governor's home city, and the buildings face beautiful Bliss Park, one of his benefactions.

There are four main buildings, the middle one of the group being the administration building; the dormitories, one for men and the other for women, are widely separated, on each side, while the factory, heating plant and warehouse are situated directly behind the administration building. They are built of vitrified brick, with cut-stone trimmings, and arranged with special regard to the peculiar requirements of sightless people. The administration building contains the offices and vaults of the institution, reception rooms, the state circulating library for the blind, the chapel and the living rooms of the superintendent.

As a mere matter of cost, the blind who need help, like any other class needing help, could doubtless be taken care of more cheaply in poorhouses or in other places where no attention need be given to teaching trades. But if we take into consideration the renewed hope, the regained usefulness and the brightened lives made possible by such institutions, they *are* a necessity.

An adult enjoying unimpaired use of his senses and filling a useful place in the world, when suddenly deprived of sight

by an unforeseen accident or by the slow process of disease, finds himself in a most distressing condition. In the darkness of despair, with no prospect of relief, life has little hope, for the flame of ambition —the joy of progress—has been extinguished. The weeks and months drag on until mere existence becomes a burden, the discontent and misery of the afflicted bearing heavily on the happiness of the family life. Constant brooding over the perversity of fate often affects the mental faculties, resulting in insanity unless the entire train of thought is quickly diverted.

THE FEATHER-DUSTER FACTORY

This is the only institution of its kind for the blind. There is a large market for the dusters

It is here that the employment institution proves a saving grace. It takes the sightless and teaches him a useful trade or one of the more simple professions, as the education and capabilities of the person may determine. With renewed hope and an independent spirit, the afflicted one returns to his home contented and in a cheerful frame of mind, and follows his chosen occupation, once more a useful citizen.

A few individual cases, illustrating all phases of the different things attempted, explain the work at the present time. E. W. was formerly employed as foreman in one of the large Detroit brass and copper rolling mills, and a few years ago lost his sight from an accident in the shop. For three years he was at home, nearly helpless, scarcely able to feed and dress himself. Hearing of the institution soon after it was opened, friends wrote, asking to have him admitted. He entered on February 6, 1905, and stayed until May 27, 1905. During this time he learned to use the typewriter, to read and write the Braille or point system, and made a good start at learning the broom trade. Being a man of business instincts and too old to learn to work rapidly at the broom trade, he was advised to try selling brooms. He went to Detroit and, hiring a boy to go around with him, made a canvass of the grocery stores and shops, taking orders of from one to twenty dozen brooms, and earning from $5 to $15 a week. He is now a self-respecting, producing citizen, earning enough to care comfortably for himself. From one of his letters is quoted this extract, none the less effective for its German form of expression:

"Mr. Hamilton, I can never you enough

BASKET WEAVING

thank for what the institution has done for me. I owe it everything. I am again a man and of some use in the world. I do not more make my people unhappy, as I am now content."

Some time ago, after some correspondence, J. S. was brought from a county poorhouse. He is doubly afflicted, being both deaf and blind. Since entering the institution he has learned to sew brooms, cane chairs, use the typewriter well, and is one of the happiest, most contented men there. The attendants and some of the inmates talk to him, by using the deaf and dumb alphabet. He simply puts his hand on that of the talker, and in this way conversation can be carried on quite rapidly, and explanations made are easily understood. Recently another deaf and blind man was admitted, and S. took him in charge to teach him the way about the buildings. Each seemed happy to have met the other, and they have been of mutual benefit.

For one of the other men, who learned piano-tuning, but had not the qualifications requisite for working up an outside patronage, the superintendent secured a good position in a New York piano factory, where he is doing well.

The problem of finding work for the women and girls is more difficult, but the institution is doing what it can to secure profitable occupations for them. Several are employed in the institution. The visitors' attendant is a blind girl, and she shows company around so well that many refuse to believe that she is entirely blind. The seamstress is a blind girl, and does all the mending and making of tablecloths, napkins, pillow-cases and sheets, using a sewing machine as well as any of her sisters who can see. Since securing a blind girl to do the dish-washing, the work has always been satisfactory.

The institution is a combination of the industrial home and the workshop, taking adults from eighteen to sixty years of age. Partially blind as well as totally blind persons are admitted. But a person with some sight is less efficient as a worker than one entirely blind and, strange as it may seem, he is a far less rapid operator. The reason for this is that one who is not entirely sightless sees objects in a dim hazy film in which nearly all detail and the general outlines fade away in the gray background, but still from force of habit and inclination the worker depends on his failing sight to aid him, while the entirely blind rely only on the sense of touch, which soon. in constant and more exacting use, becomes very keen and sensitive.

Apprentices are allowed not more than three years in which to acquire the different trades taught, and during this time board, lodging and instruction are free. After a trade has been learned, the apprentice becomes a wage-worker if he cares to remain. He is put on the pay-roll, and is paid by the piece at current wage rates. He then begins paying board, and may lodge in or out of the institution, as he prefers. As the apprenticeship idea is combined with the workshop and home, it will be readily seen that this institution never can become self-supporting, or even nearly so, as board, lodging and instruc-

tion for all the learners must remain free, and these apprentices always form a large per cent of the total number enrolled. During the first half of 1909, there were nearly one hundred inmates in the institution, and of this number about three-fourths are men. This is due to the fact that the problem of how best to care for and give profitable employment to blind women has not been solved. New industries are being introduced, but the difficulty seems to be in finding occupations adapted to women's strength and endurance, at which they can work rapidly enough to be self-supporting and at the same time follow when they return to their homes. The recaning of chairs, basket-making, weaving of fancy table-covers in unique and attractive designs, usually to special order, are the principal industries now carried on for women. A few of the inmates are employed in sorting broom-corn, selecting feathers for dustermaking, besides those who are engaged in the direct work of the institution.

For the men the broom trade is the principal occupation. There is an almost unlimited market for brooms, and with the institution established as it is, it is necessary to give steady employment to those wishing it. After going on the pay-roll, the men pay $2.50 a week for board, room and washing, which, it is estimated, is about the actual cost. They are paid almost entirely by the piece at current wage rates, and on this basis the poorest workman has cleared about $1 above his board at the end of the month, and the best and most rapid worker, something over $25. The plan of the institution in this regard is to pay a rate which is just and reasonable, but, at the same time not high enough to be too great an incentive to the workers to remain indefinitely after they have become skilled in their trades and can earn as much or more outside. The institution is primarily a trades school rather than a permanent home for blind people.

In addition to broommaking, cobbling is taught, and two of the men keep in repair the footwear of all the inmates besides doing some work for people in the neighborhood. The work is surprisingly well done and they have even undertaken the making of shoes with very satisfactory results. Rug-weaving from old carpets has been introduced with success, and several workers have become proficient enough to return to their home towns, set up looms and through their friends secure all the weaving they can do. Piano-tuning is taught to a few having qualifications for the work, and they have done well in every instance. Feather-duster making is the latest industry established and this institution is the first one of the kind to introduce the making of dusters. It promises well and there is a large market for the various grades of dusters made. Some portions of the work can be done well and rapidly by women, and it is clean and to their liking.

While the work of instructing and training the adult blind is new, and necessarily in more or less of an experimental stage, it has been found that many pursuits that blind people can follow can not be worked with enough rapidity to make them practical as life-work. To illustrate: Blind girls are perfectly capable of doing the best kind of work with ordinary knitting machines, such as are used in all knitting factories, but they work so slowly that they can not make wages enough to keep themselves. And when it is remembered that among those who can see, nearly every artisan of any skill or proficiency learns a trade before he is twenty-one years of age, the difficulties attendant on taking people who have become blind late in life and teaching them to become skilled workmen and at the same time rapid ones, can be slightly appreciated.

Among the men who have been admitted were former farm hands, machinists, painters, sawyers, railroad firemen, expert bookkeepers, graduate druggists, some from the army and navy, and many who, having been blind from childhood, have no trades at all. The task of helping these people to adapt themselves, in many cases, to new conditions and to form new life habits; of encouraging and cheering the most despondent ones; and of making those with families believe that they can, by hard work, again help take care of those dependent upon them, is no easy one.

One of the most important features of the institution's work is the Free Lending Library, which the establishing act requires to be conducted. By the provisions of the Rucker Bill, which was passed by Congress and became a law, April 27,

1904, reading matter for the blind may be sent free of postage anywhere in the United States, when sent from or returned to a lending library. Scattered through Michigan are many blind people to whom books of the various Braille point systems are sent when called for, and after they have been read or studied, they are returned to the library. Thus to many not in the institution, hours of recreation and profitable study are given, as the list of books includes works of history, poetry, fiction, science, music and current literature.

As there are many of the inmates who have become blind in later life, and so have had no chance to learn to read or use the typewriter, instruction is given in this as well as in reading the embossed-point systems, in connection with the library. Those leaving the institution to go into business for themselves can therefore avail themselves of the library privileges, and besides can do their own corresponding with an ordinary typewriter. To be able to read again and communicate with others by putting their thoughts on paper, after years of not having written a single letter, is a source of boundless pleasure to many of the blind people, besides making them much more independent in their business dealings.

The library now contains several thousand volumes printed either in the Roman line-letter, the European Braille, the New York point and the American Braille, the last named being the officially recognized embossed type of the state. It is the system preferably taught in the institutions, for several reasons, the first of which is, it provides for capitalization and punctuation, and symbols for contractions, features considered valuable to advanced students and teachers of the blind. Being a three-point system more space is required than for the New York point (two point), but the advantages named more than balance the defects of the latter.

All books for the blind are bulky and heavy volumes, and to pack them for mailing, strong cloth cases of the telescope kind are used, strapped together securely. To render the return of the package easy for the borrower, the name and address of the institution are printed in large bold letters on the cover of the case, so that miscarriage is impossible. When the case goes to the borrower a tag with the name and address printed on an ordinary typewriter, is attached to the case, covering the name and address of the institution and tied down by stout twine. All the borrower has to do is to detach the tag, secure it through holes in the upper left-hand corner of the case and tie it down. The simple and easy scheme was devised by A. M. Shotwell, the blind librarian, who by education and temperament is well qualified for the exacting work of the library. In all matters pertaining to the blind Mr. Shotwell is a recognized authority of international repute.

But the teaching of reading of the embossed-point systems and instruction in the use of the typewriter to produce the characters, and the use of the ordinary typewriter of everyday kind, are not all the achievements of the blind in this remarkable institution. Shorthand for the blind is an assured fact and is now recognized as a practical field for them. The Stainsby-Wayne, the wonderful machine which is used for shorthand notes, weighs only nine pounds, and is very simple in its mechanism, having only six keys with which to form all the combinations used in the system. The blind stenographer uses the six keys just as the seeing stenographer uses his pencil, the system being much the same, only more arbitrary. By pressing on the keys with a quick, elastic touch, the raised shorthand type cipher is printed on a slip of white paper, which unwinds from a large roll placed in a bracket at the left side and travels across a tray on the top of the machine. This paper resembles the ticker used in the stock exchange. After the dictation has been taken, the paper is rolled back again and is then ready to be read with the fingers and transcribed on the typewriter. It is possible to attain a high rate of speed, the machine being guaranteed to write one hundred and forty words a minute.

The institution at Saginaw is not a copy of any other establishment, and its work and methods are very different in important particulars from those of any other working home or trade training school for blind adults.

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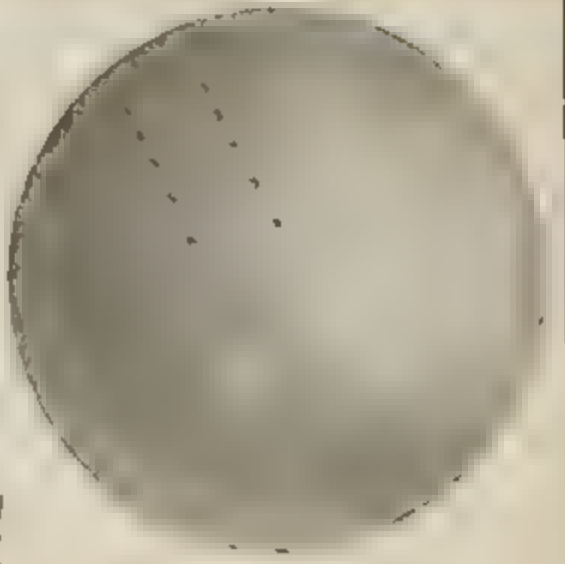

The standard [illegible] all used by all big leagues and in important match [illegible] made [illegible] eight sections of this [illegible] possible [illegible] inflating pump, lacing needle and leather [illegible]

*Must be used in all match [illegible]*

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*Write for FREE copy of Reach Fall and Winter Sp[illegible]*

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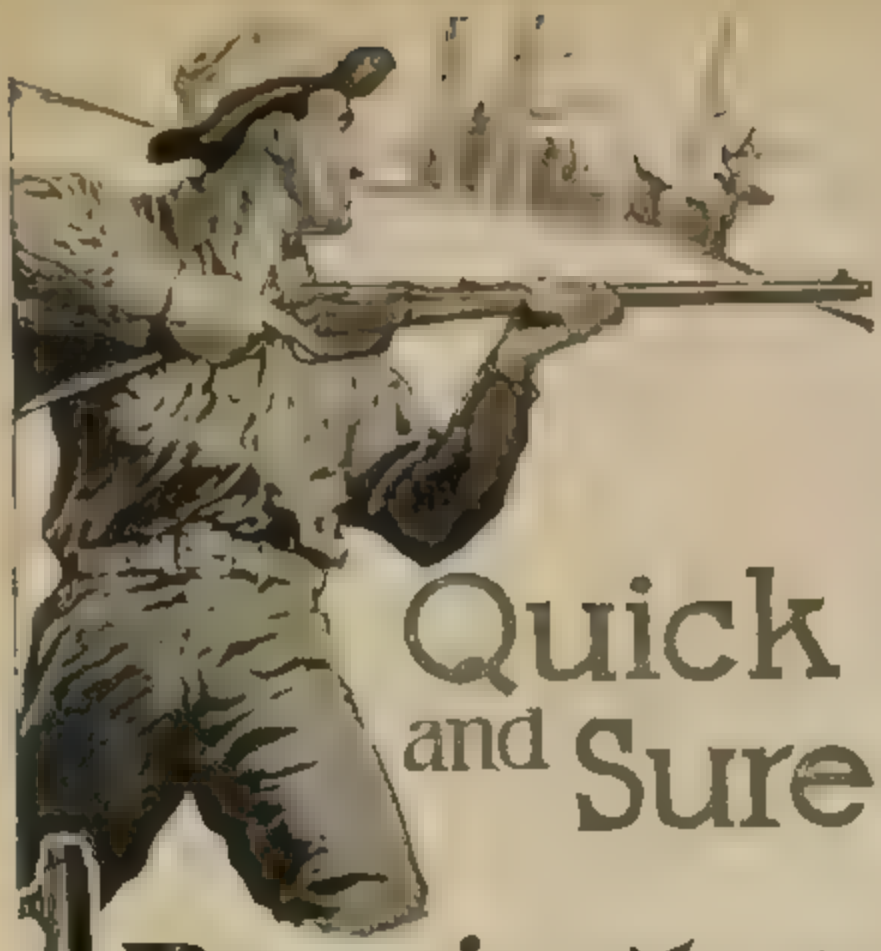

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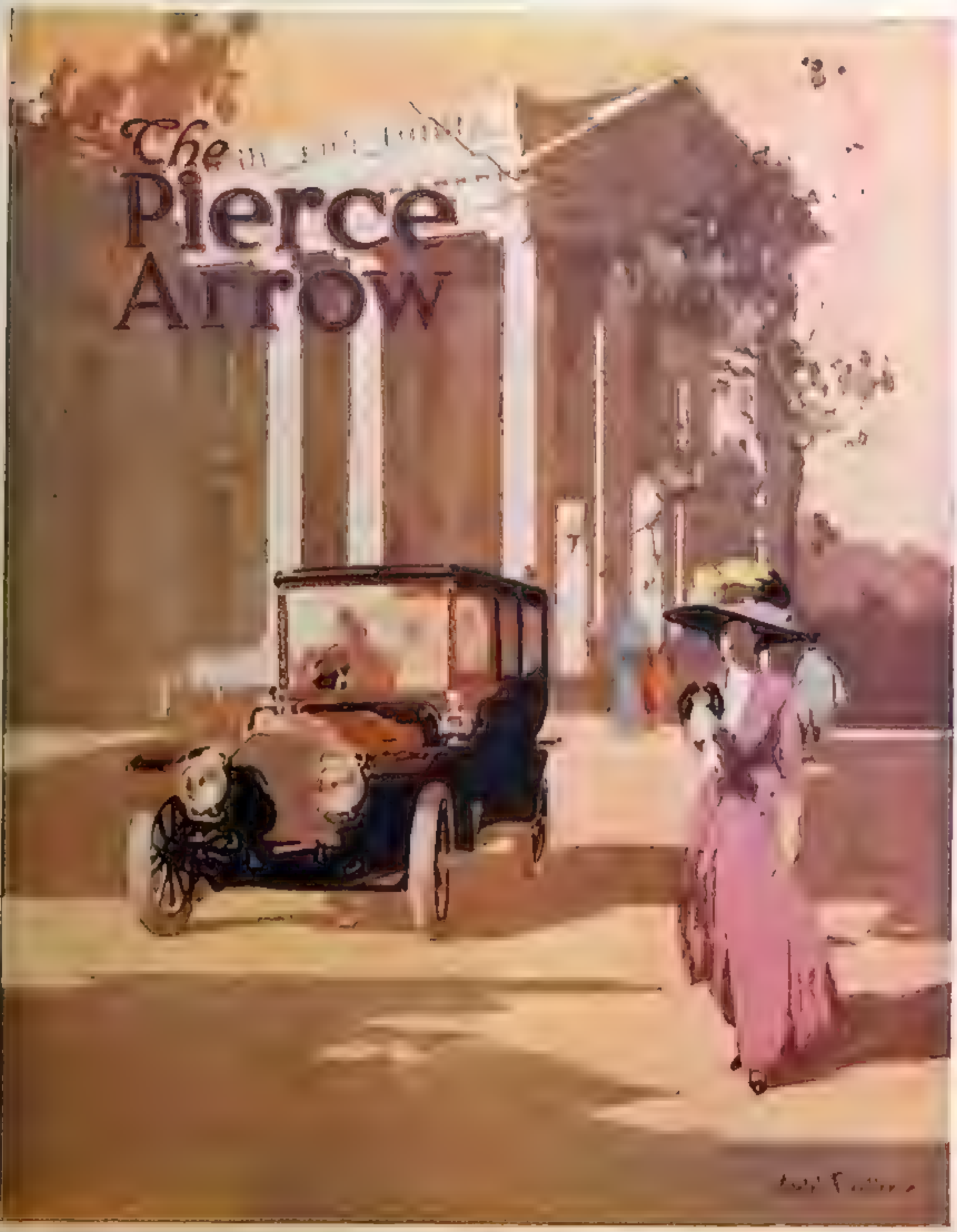
The Pierce Arrow

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DRAWN BY
SARAH S. STILWELL WEBER

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FOR THE
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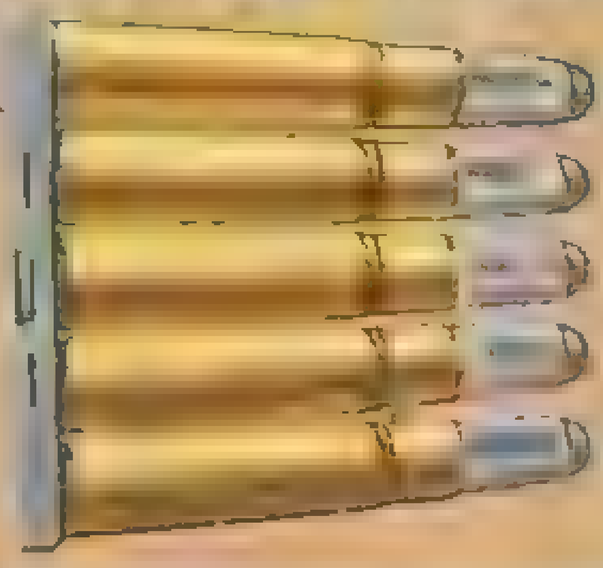
FIVE KNOCK-DOWN BLOWS

THE
Remington
AUTOLOADING RIFLE
LOADS WITH
A CLIP



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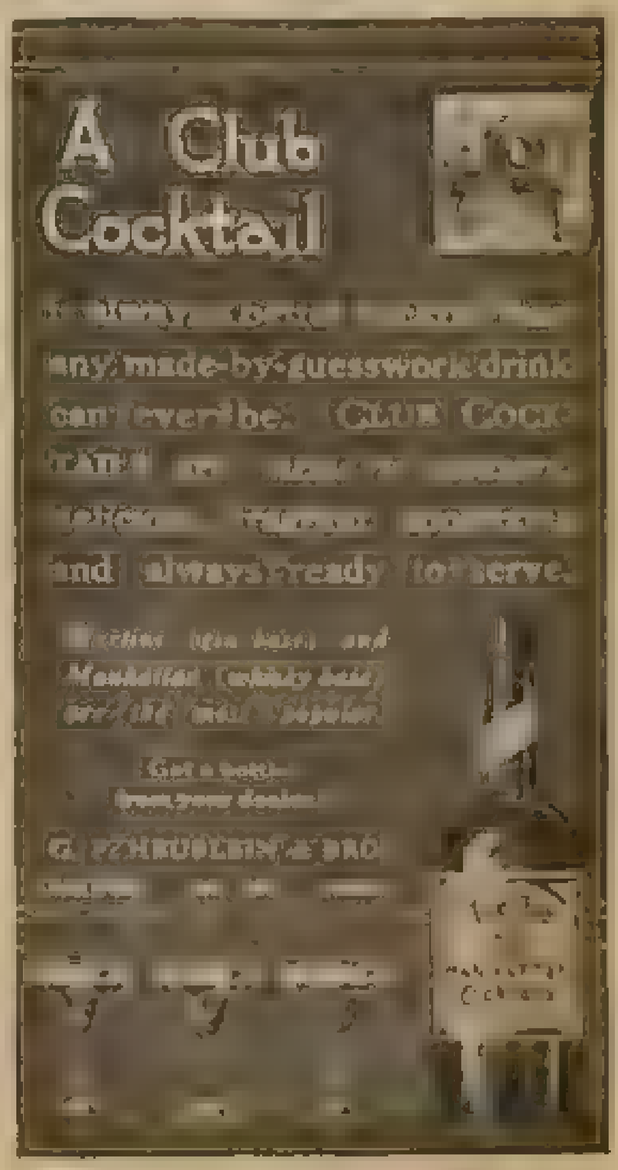
### It Might Have Been

Jenny kneel Mr

[illegible]

And it was not unexpected
With a [illegible]
Both her lips were [illegible]

### Dress Reform Needed



### He Got the Direction

[illegible] rived, a shade bustled up to St[illegible]

[illegible]r," will you tell me [illegible] your postcards?"

[illegible]ply, told him [illegible]

whispered, "One toot, and [illegible] on's [illegible]

# SUNDAY MAGAZINE
## Of the NEW-YORK TRIBUNE

NEW YORK
MAY 23, 1909
PART III
20 PAGES

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# SUNDAY MAGAZINE
## Of the NEW-YORK TRIBUNE

PART III.
20 PAGES

NEW YORK
FEBRUARY 28, 1909

# HARPER'S WEEKLY

EDITED BY GEORGE HARVEY

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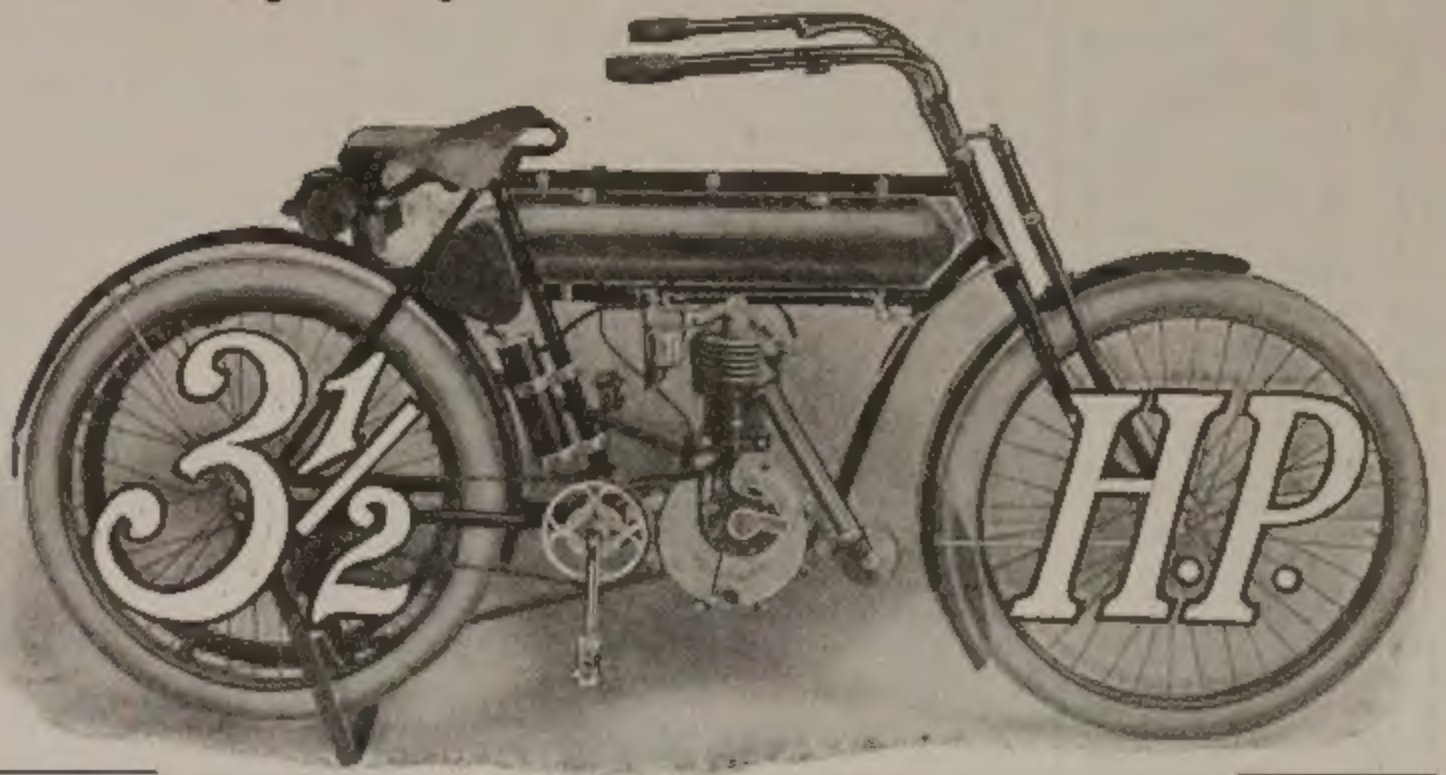


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